

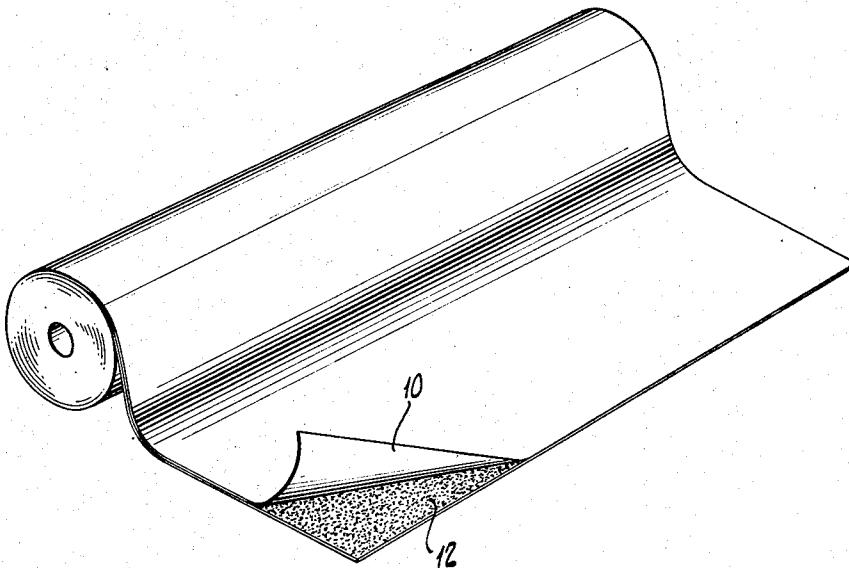
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ASBESTOS ROOFING FELT AND METHOD OF MANUFACTURE

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ASBESTOS ROOFING FELT AND METHOD
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This invention relates to flexible and waterproof roofing felts, and is particularly concerned with asbestos roofing felts which are weather resistant, white and light reflecting, and to a method of manufacturing the same.

An object of the invention is to provide a weather resistant asbestos roofing felt the exposed surface of which is white in color and light reflecting.

A further object is to provide a multi-ply asbestos roofing felt which is weatherproof and which is sufficiently flexible to be shipped in rolls and to be applied to a roof by conventional methods.

A feature of the invention is a flexible multi-ply asbestos roofing felt in which the base plies are asphalt saturated, and having a facing ply consisting of white relatively porous weather and stain resistant asbestos paper which is strongly adhered to the base plies.

Attempts heretofore made to ply an unsaturated asbestos paper facing sheet to a base felt of asphalt saturated asbestos after impregnating the facing sheet with insoluble silicates such as calcium silicate or zinc silicate, have encountered difficulties because such silicates tend to prevent strong adhesion of asphalt to asbestos and fail to prevent staining of the white asbestos facing sheet by asphaltic oils in the plied product. Furthermore silicates of the type of zinc silicate tend to impart brittleness to asbestos sheets treated therewith and do not impart suitable waterproof properties when used in the limited amounts permissible when it is desired to retain some measure of flexibility.

Another object is to provide a treatment for a white asbestos paper roofing felt which will impart thereto suitable waterproofing properties, flexibility, strong adhesiveness to asphalt, and resistance to staining by asphalt.

With the aforesaid objects and feature in view the invention consists in the improved flexible light-reflective roofing felt and method of manufacture which are hereinafter described and more particularly defined by the accompanying claims.

In the following description reference will be made to the attached drawing, which presents a perspective view of a roll of multi-ply roofing felt in accordance with the present invention, showing one end of the felt unrolled and with a corner of the white asbestos paper facing sheet torn away from the base sheet to show the ply construction.

The principal novel element of the illustrated roofing felt consists of a white comparatively porous unsaturated sheet 10 of asbestos paper which contains a small amount of stearic acid uniformly distributed in thin films throughout the pores and on the fibers of the sheet in amount sufficient to render the sheet water repellent, resistant to staining by asphalt oils in contact therewith, and resistant to deterioration or ex-

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foliation under prolonged exposure to the weather.

According to a preferred method of manufacture, a sheet of white asbestos paper of suitable width and length for rolling up and handling as roll roofing, is impregnated with a solvent solution of stearic acid, followed by heat drying to remove the solvent. The impregnating solution may comprise stearic acid in any one of a number of solvents such as benzol, gasoline, alcohol or carbon tetrachloride. The strength of the impregnating solution may range between say 0.5% and 10% or higher. A satisfactory impregnating solution has been found to comprise about 2% by weight of stearic acid dissolved in carbon tetrachloride. The impregnating solution may be applied to the dry white asbestos paper sheet at normal temperature by any one of a number of conventional methods, such as by applicator rolls, spraying, or dipping the sheet in a bath of the solvent reduced stearic acid.

Alternative methods of introducing stearic acid into the paper sheet may include impregnation of the previously formed paper with an aqueous dispersion of stearic acid, or by adding an aqueous dispersion of stearic acid to the asbestos fiber furnished during the paper manufacturing operation.

The treatment with stearic acid may be followed by drying by means of heated rolls, or in a conventional drier or oven. The dried sheet 10 thus treated contains only a small proportion by weight (normally between 0.5% and 10%) of stearic acid distributed in thin films within the pores and on the surfaces of the fibers throughout the sheet. The sheet thus formed is sufficiently water repellent and weather resistant, and has sufficient flexibility and strength, as to adapt it for use as a roofing felt. Normally, however, it is contemplated that such sheet shall serve as the top facing sheet of a multi-ply roofing felt such as illustrated in which the base plies consist of asphalt saturated roofing felts as, for example, asphalt saturated asbestos paper.

In assembling a plied roofing felt having a stearic acid treated white asbestos paper facing, a suitable procedure is as follows: The dried stearic acid containing sheet 10 is applied as a facing sheet to underlying single or multiple ply felts 12 of asphalt saturated paper, and a strongly plied felt is formed by passing the plied sheets through heated press rolls or by other conventional plying methods. To develop a strongly plied product it may be necessary to first coat the upper surface of the asphalt saturated base sheets 12 with an additional thin coating of asphalt or equivalent waterproofing adhesive, before applying the facing sheet 10, in order to provide an adequate amount of binder at the interface between the two felts.

If the plied product is to be rolled it is de-

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sirable to wet the stearic acid containing sheet 10 with an aqueous solution of alcohol after it has been plied as a facing sheet to the underlying sheets. This alcohol wetting treatment is not necessary where the plied sheets are to be cut to final form for application as roofing, without being rolled. Wetting of the facing sheet with the aqueous alcohol solution (for example a solution of 50% ethyl alcohol and 50% water), after plying, serves to temporarily overcome or reduce the waterproofing properties of the stearic acid to an extent which allows the white facing sheet to stretch sufficiently to permit rolling of the assembled plied product without any serious danger of rupturing the facing sheet.

A white relatively porous asbestos paper facing sheet 10 which has distributed therethrough a small proportion of stearic acid develops a strong adhesive bond when plied to underlying asphalt saturated sheets. The presence of the stearic acid tends to enhance the adhesion of the asphalt to the asbestos. Stearic acid is a polar compound and is particularly effective because it has a molecule with water wetting properties on one end and asphalt or oil wetting properties on the other. Hence the stearic acid acts to adhere the water wetted asbestos to the organophilic asphalt. The stearic acid also imparts suitably permanent water-proofness to the facing sheet and renders such sheet resistant against staining by asphalt present as a saturant in or coating on the underlying plies 12 of asphalt saturated paper. The presence of a small amount of stearic acid in the facing sheet 10 also imparts thereto strong resistance against exfoliation or deterioration by prolonged weather exposure. The weathering properties imparted by stearic acid are in part the result of its tendency to react with free alkali present in the asbestos and to thus form a metallic soap interface. Thus, even though there may be gradual displacement of stearic acid as a result of weathering, the product continues to exhibit weather resistance because of the waterproofing properties of insoluble magnesium or calcium stearates thus formed.

The invention which has been thus described by detailed example is not limited as to such details and it is to be understood that variations, changes and modifications are contemplated within the scope of the invention as defined by the following claims.

What I claim is:

1. A white and relatively porous asbestos fiber roofing felt having uniformly distributed therethrough between 0.5% and 10% by weight of stearic acid in the form of thin fiber coating films, said stearic acid imparting good weathering properties, resistance to exfoliation, and resistance to staining.

2. A light reflecting roofing felt comprising a sheet of white asbestos paper having stearic acid distributed throughout pores thereof in the form of thin fiber coating films in amount ranging from 1/2 to 10% by weight of the paper.

3. A multi-ply flexible roofing felt having as its base member an asphalt saturated asbestos fiber felt, and having a top surface ply comprising comparatively white unsaturated asbestos paper having uniformly distributed throughout the pores thereof between 0.5% and 10% by weight of stearic acid in the form of thin fiber coating films, said stearic acid imparting water repellent and non-staining properties to the top ply and strengthening the bond between the top and base plies.

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4. A light reflecting flexible roofing felt comprising a base sheet of asphalt saturated fiber felt and a top surface sheet of white asbestos paper adhered by asphalt adhesive to the base sheet to form a flexible multi-ply felt, said paper surface ply incorporating stearic acid in the form of thin fiber coating films throughout its porous structure in amount comprising 1/2 to 10% by weight of the paper sheet.

5. In manufacturing a light reflecting waterproof roofing felt the steps comprising, distributing stearic acid in amount ranging between 0.5% and 10% by weight, while diluted with a volatile liquid, throughout a sheet of white asbestos paper and subjecting said sheet to a heat drying treatment to eliminate volatile material and precipitate stearic acid in film form.

6. In manufacturing light reflecting waterproof and flexible roofing felt the steps comprising, distributing stearic acid in amount ranging between 0.5% and 10% by weight, while diluted with a volatile liquid, throughout white asbestos paper, heat drying the paper to drive off volatiles, and by pressure adhering the thus waterproofed paper as a top surface ply to a base sheet of asphalt saturated roofing felt.

7. In manufacturing a multi-ply asbestos roofing felt the steps comprising, saturating base plies with an adhesive bituminous waterproofing saturant, saturating a surface ply of comparatively white porous asbestos paper with stearic acid diluted with a volatile liquid, drying the thus saturated surface ply to drive off volatiles, applying the dry surface ply as a facing to the saturated base plies and consolidating under pressure to develop adhesion, and moistening the facing sheet of the thus plied felt with an aqueous alcohol solution prior to stretching the sheet in forming a multiple ply roll thereof.

8. In manufacturing a roll of light reflecting multiple ply asbestos roofing felt the steps which comprise, moistening a facing sheet of stearic acid containing white asbestos paper with an aqueous alcohol solution after adhering said sheet by pressure as a facing to a base ply sheet of asphalt saturated fibrous roofing felt, and rolling the plied felt.

9. A light reflecting flexible roofing felt comprising a base sheet of bitumen saturated fiber felt and a top surface sheet of white asbestos paper adhered by bituminous adhesive to the base sheet to form a flexible multi-ply felt, said paper surface ply incorporating stearic acid in the form of thin coating films throughout its porous structure in amount comprising 1/2 to 10% by weight of the paper sheet.

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