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FLOOR COVERING AND FELT BASE MATERIAL

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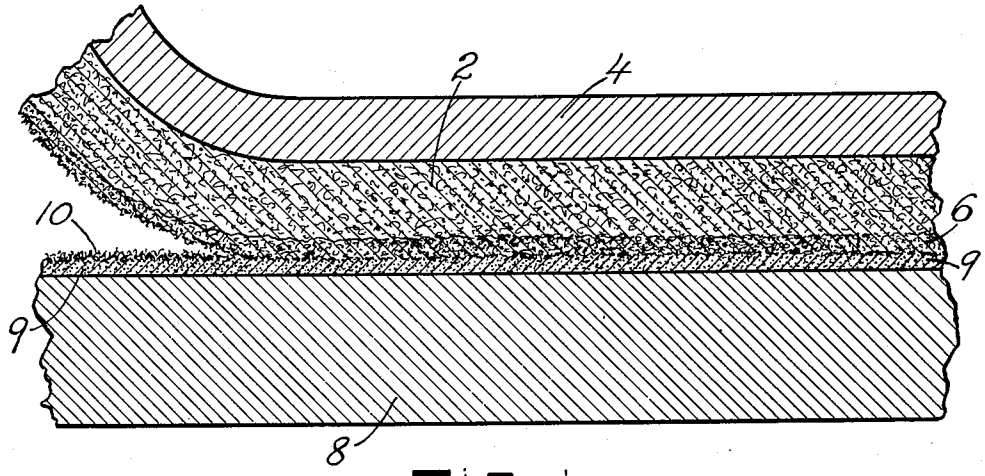

Fig. 1.

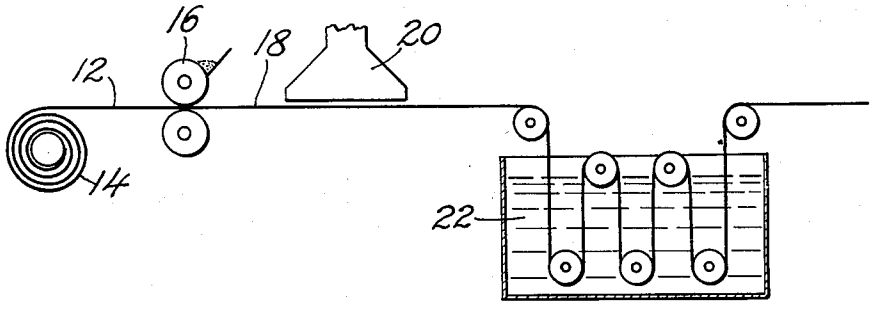

Fig. 2.

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FLOOR COVERING AND FELT BASE MATERIAL

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4 Claims. (Cl. 20—7)

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This invention relates to asphalt or bituminous saturated felt base floor coverings and similar products wherein the felt is provided with a zone of relative weakness for permitting ready removal of the product from a surface to which it has been cemented.

It is usual practice to cement asphalt saturated felt base materials to wood or cement floors or to other surfaces to which they are applied. However, when it is desired to remove the covering for replacement or application to a new location, the product usually tears and the portion of the saturated felt which remains cemented to the floor can only be removed by scraping or the use of special solvents. As a result it is frequently found that the cost of removing the old floor covering from a surface to which it has been cemented exceeds the cost of applying and cementing a new product to the surface.

Previous attempts to provide a splittable or delaminating type of saturated felt base material have required the use of special saturants or special saturating operations and the resulting products have not always been satisfactory.

In accordance with the present invention these objections to prior products and methods are overcome by applying to one surface of the dry felt a composition which is incompatible with the saturant to be employed and which at least partially coats the fibers of the felt so as to prevent adhesion of the saturant thereto. Thereafter upon saturation of the felt the resulting product contains a limited or lesser amount of saturant adjacent that face of the felt designed to be cemented to a surface than it has adjacent the surface to which decorative material is applied. Therefore when such product is removed from a surface to which it has been cemented the felt base splits easily leaving only a thin layer of material adhering to the floor. The product removed remains in a condition to be relaid if desired and the portion of the felt remaining bonded to the floor or surface is easily removed.

One of the objects of the present invention is to provide a novel type of splittable felt base material.

Another object of the invention is to provide a felt base for floor coverings and similar products in which that side of the felt designed to be cemented to a surface contains a limited amount of asphaltic or bituminous saturant.

A further object of the invention is to provide novel methods for producing saturated felt.

These and other objects and features of the

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present invention will appear from the following description thereof in which reference is made to the figures of the accompanying drawing.

In the drawing:

Fig. 1 is a vertical sectional view through a typical product embodying the present invention, and

Fig. 2 is a diagrammatic illustration of mechanism suitable for use in producing felt base materials embodying the present invention.

In that form of product illustrated in Fig. 1 the felt base material is indicated at 2 and is provided with a layer of decorative material 4 applied to the upper surface thereof. The lower surface 6 of the felt base is provided with a barrier coat which serves to partially coat the fibers and to partially fill the interstices between the fibers whereby the concentration of asphaltic or bituminous saturant in the layer 6 is limited. The composition and concentration of the material forming such barrier coat is preferably such as to impart limited strength to the layer 6 and since the concentration of the asphaltic saturant is limited the resulting product is much more easily split along the layer 6 than elsewhere throughout the body of the felt. For this reason when the product is striped from the floor or surface 8 to which it had been cemented the felt splits along the layer 6 leaving only the cement 9 and a thin minor portion 10 of the felt adhering to the floor.

The composition used in forming the barrier coat for the fibers of the splittable layer 6 may be varied considerably. It is generally selected from those compositions which are incompatible with asphaltic or bituminous saturants and which can be easily applied to the felt in the form of a liquid such as a dispersion or solution of the barrier material. Typical of such compositions are starches, glues and resinous or rubber like materials which form dispersions or solutions in water, alcohol or other common liquid media. These include water solutions or dispersions of cornstarch or mixtures of powdered aluminum and starch and latices in which vinyl resins, acrylic resins, neoprene, butadiene, styrene or other resins or materials which are imcompatible with asphalt are suspended or dispersed.

The barrier coat is applied to one face of the dry felt, prior to saturation, by any suitable method as by means of a coating roll or spray. The coat is preferably dried before saturation of the felt with bituminous material. Thus as shown in Fig. 2 a web of dry felt 12 is drawn from a roll 14 and passed to a coating device 16 which

serves to apply the barrier coat 18 to the upper surface of the web. The coated web then passes to a dried 20 and is subsequently passed into a saturating bath 22 or to other equipment for impregnating and saturating the web with asphalt or other bituminous material. After being thus saturated the product is cooled and dried or otherwise prepared for the application of a decorative layer thereto. Thus for example a layer of "face paint" is preferably applied to the saturated face of the web and two layers of backing paint are applied to the face of the web which contains the barrier coat. The decorative material may be a linoleum or other plastic composition or it may be a paint or similar liquid composition. Such decorative layer is applied to that face of the saturated felt opposite to the barrier coated face and over the face paint thereon so that the weak splittable layer 6 of the felt base carrying the backing paint will be exposed for cementing the product to a floor or other surface to which the product is to applied.

The amount of material applied to the dry felt in forming the barrier coat depends largely upon the character of the composition used in forming such coating. However, in general it is controlled so as to impart to the layer 6 a laminating strength in the finished product which is less than the tear or breaking strength of the fully saturated layer 2 of the felt and also less than the adhesive or bonding strength of the cement by which the product is ordinarily secured to a floor. Thus the breaking strength of asphalt saturated felt is usually about 10 to 12 pounds for a three inch strip whereas the usual "linoleum pastes" employed for cementing felt base linoleum products to a floor will withstand a pull of from about 8 to 12 pounds upon a strip three inches wide. The barrier coat is therefore applied to the dry felt in amount sufficient to give the layer 6 of the saturated felt a laminating strength of only about 5 to 7 pounds for a three inch strip. Products so formed therefore will split readily along the layer 6 without injury to the fully saturated felt layer 2 or the decorative layer 4.

The desired limited laminating strength of the layer 6 of felts saturated with asphaltic or bituminous materials is obtained by the application of dispersions of the incompatible compositions to one face of the dry felt at the rate of about .02 to .08 pounds of solids per square yard of felt. The following represent typical applications of barrier coats to dry felt in accordance with the present invention:

Composition	Liquid	Solids in Lbs. Per Sq. yard
Modified vinyl chloride (31× Geon Latex)	water	.04
Butadiene-styrene (Dow 512K Latex)	do	.06
Chlorobutadiene (735 Neoprene Latex)	do	.05
Polymerized ester derivatives of crylic acid (Rhoplex MR or WN-80).	do	.06
Hydrogenated rosin (Viasol)	alcohol	.06
Aluminum powder with cornstarch	water	.03
Cornstarch	do	.04
Glycol Bori-Borate (Aquaresin)	do	.05
Polyvinyl acetate (Elvacet)	do	.05

When dry felts are provided with a barrier coat on one face as indicated in the above table, and thereafter saturated with asphalt in amount equal to 110% of the weight of the dry felt, it is found that the laminating strength of the layer containing the barrier coat is in each instance within the limits of about 5 to 7 pounds for a three inch strip of the product.

For reasons of economy cornstarch is preferred as a barrier coating composition. A solution of the starch is readily made up for application to the dry felt by using the following proportions of ingredients:

	Parts by weight
Cornstarch (pearl gray)	6.4
Liquid soap	4.8
Fungicide	0.1
Water, to coating viscosity.	

This composition is applied to one surface of the felt by means of a squeeze roll coater or in any other suitable manner and at a rate to deposit .04 to .06 pound of starch on each square yard of surface of the felt.

The depth to which the barrier coat composition penetrates the dry felt determines the thickness of the weakened zone or layer 6 of the saturated felt. The penetration will vary with the viscosity or surface tension of the liquid coating composition containing the barrier forming agent and the equipment and manner by which the coating composition is applied. The barrier coat and zone of weakness may extend to a depth equal to from 10% to 40% of the total thickness of the felt, and preferably to a depth of 20 to 25% of the felt. The density of the barrier coat also may be varied but it is not desirable to completely coat the fibers or to fill the pores of the felt in the zone of weakness forming the layer 6 of the finished product. It is designed instead to reduce the concentration of the asphaltic saturant and to limit the strength of the bond between the saturant and the fibers of the felt by partially coating the fibers and restricting the pores of the felt without sealing the coated surface of the felt altogether. The concentration of the asphaltic saturant in the weakened zone thus may equal from about 10% to 60% of the weight of the dry felt whereas the concentration of the saturant throughout the main body of the felt and adjacent the surface of the felt to which the decorative layer is applied may vary from about 80 to 140% of the weight of the dry felt.

The felt carrying the barrier coat is dried before saturation with asphalt. In saturating the treated felt it is necessary to allow the felt to remain in the saturating tank for a sufficient length of time to permit thorough penetration of the saturant into the pores and interstices of the felt. The barrier coat limits the penetration of the asphalt into the felt through that surface to which the coat is applied and therefore the duration of the saturating operation is prolonged somewhat, particularly when high concentration or uniformity of penetration of the saturant are required.

The adhesion of decorative material to the surface of the felt base opposite to that carrying the barrier coat is of course in no way impaired and therefore any of the usual linoleum or plastic materials or paints may be applied to the felt in forming floor coverings. On the other hand the presence of the barrier coat and the limited asphalt content of the layer 6 of the product does not impair its adhesion or bonding to cement, wood or other types of floors or surfaces when employing conventional "linoleum cements." However, when the product is removed from a floor the minor portion 16 of the felt which remains bonded to the floor is that portion which contains the least asphalt and the greatest percentage of starch or other barrier coating composition. Such remaining film can therefore be

removed by scrubbing or washing much more readily than a film of comparable thickness containing a higher percentage of asphalt. In particular when the barrier coating composition is a water soluble or dispersible material such as cornstarch the thin film of fibers adhering to the floor is released by the application of water whereby the floor may be cleaned and prepared for the application of other floor coverings with a minimum of effort and expense. Moreover, staining of the floor is practically eliminated since the concentration of asphalt adjacent the floor is very limited. Therefore it is seldom if ever necessary to scrape the floor in order to restore it to its original condition after removal of the floor covering.

While it is generally preferable to employ barrier coating compositions in the form of water solutions or dispersions the coating may be applied in the form of a solution of the asphalt-incompatible material in an organic solvent such as alcohol. Furthermore the manner in which the barrier coat is applied and the manner in which the coated felt is saturated with asphaltic or bituminous materials may be varied considerably without departing from the present invention. In view thereof it should be understood that the embodiments of the present invention herein described and shown in the drawing are intended to be illustrative only and are not intended to limit the scope of the present invention.

I claim:

1. Flexible felt base material comprising a sheet of felt saturated with bituminous material and containing a higher concentration of said saturant adjacent one face of the sheet than the other, the portion of the sheet containing a lesser amount of saturant also containing starch partially filling the pores between the fibers and serving to limit the adhesion of the bituminous material to the fibers, the latter portion being equal in thickness to from about 10% to 40% of the total thickness of the felt.

2. Flexible floor covering comprising a base formed of felt and saturated with a bituminous material, said base having a layer of decorative material secured to one face thereof, there being a zone of weakness adjacent the opposite face of said base and constituting a layer equal in thickness to from about 10% to 40% of the total thickness of the base, said zone of weakness having a laminating strength less than that of the remaining portion of the base and containing distributed particles of starch partially filling the pores of the felt and serving to limit adhesion between the fibers and the bituminous material.

3. Floor covering comprising a layer of felt having the lower surface thereof bonded to a floor by adhesive material and having its upper surface coated with a layer of decorative wear resisting material, said felt being impregnated with a bituminous saturant and containing a higher concentration of said saturant throughout the upper portion of the felt layer and adjacent said decorative layer, the lower portion of said felt layer adjacent said adhesive material containing a lesser amount of said saturant and also containing a substance incompatible with the saturant and partially coating the fibers of the felt and serving to limit the adhesion of the saturant thereto, the laminating strengh of said lower portion of the felt layer being less than the laminating strength of said adhesive material and less than the laminating strength of the upper portion of the felt layer.

4. Flexible floor covering comprising a layer of felt having wear resisting decorative material applied to one surface thereof, the felt being impregnated with a bituminous saturant with the portion of the felt adjacent the surface to which the decorative material is applied containing a higher concentration of said saturant than the portion of the felt adjacent the opposite surface of the felt, the latter portion of the felt also containing a substance incompatible with the saturant and partially coating the fibers of the felt and serving to limit the adhesion of the saturant to the fibers, said latter portion constituting from about 10 to 40% of the total thickness of the felt and having a laminating strength of from about 5 to 7 pounds for a three inch strip, the portion of the felt containing a higher concentration of the saturant having a breaking strength of about 10 to 12 pounds for a three inch strip.

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