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H. L. LEVIN

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FIBROUS COVERING AND METHOD OF MAKING SAME

Original Filed Jan. 17, 1927

Fig. 1.

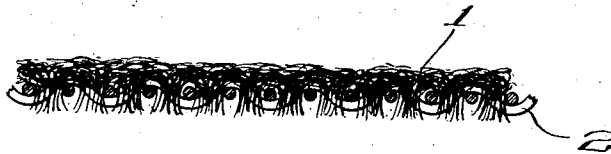
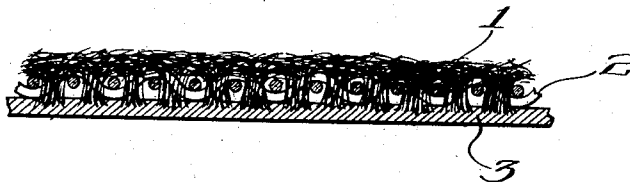


Fig. 2.



Inventor:
Harold E. Levin,
By Frank L. Belknap
Att'y

UNITED STATES PATENT OFFICE

HAROLD L. LEVIN, OF NUTLEY, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE FLINTKOTE CORPORATION, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

FIBROUS COVERING AND METHOD OF MAKING SAME

Original application filed January 17, 1927, Serial No. 161,711. Divided and this application filed May 29, 1930. Serial No. 457,474.

This application is a division of my co-pending application, Serial Number 161,711, filed January 17, 1927.

This invention relates to the manufacture of fibrous coverings and particularly that type of covering having a woven or knitted fabric base and finished with a printed design on its exposed or wearing surface.

Coverings of this character and more particularly, floor coverings, are usually produced by weaving on power looms, and since this is a somewhat complicated procedure, the product is necessarily expensive, and up to the present time no such coverings have been available at nominal cost.

With the present invention, I am able to produce a floor covering resembling very closely woven rugs, and in addition to being very much cheaper than the latter, they surpass them in many respects.

Attempts have been made to produce a cheap floor covering of this type by starting with a coarsely woven fabric such as burlap as a foundation and forming this into a needle punched fabric. This needle punching of the foundation fabric is effected by superposing over the foundation fabric a bat composed of hair or wool fibers, or both, or any similar fibers either alone or combined with the aforementioned fibers, loosely felted together in a dry condition on a "blaimer", well known in the art. This superposed bat is then partially driven or punched through the interstices of the foundation fabric, by means of a needle punch loom (also well known). At this stage of the process, the fibers project through the bottom face of the fabric (i. e. the face opposite to that upon which the bat was superposed) somewhat loosely. By pulling lightly on the fibers from either side of the product at this stage of the process, they are easily separated from the foundation fabric.

In the previous manufacture of rugs of this type, the step of printing over the wearing surface followed this needle punching step without any attempt to lock the fibers in position on the foundation fabric. Obviously a floor covering so produced was unsatisfactory for the reason that the normal traffic

to which the wearing surface was subjected, caused the fibers, which projected only loosely through the foundation fabric, to separate therefrom through abrasion and friction forming bald spots where the foundation fabric became exposed, which, of course, detract from the ornamental appearance of the covering.

On the other hand, attempts have been made to lock the fibers in place after they have been needle punched through the foundation fabric. These attempts included the use of a cut-back, i. e., a solution of a normally water-insoluble material as rubber.

The disadvantages of material of this type are several, among them being penetration through the goods with a consequent staining of the face; the fire hazard entailed in the use of suitable organic solvents; and the inability to compound with the cut-back sufficient filler to give a satisfactory degree of adulteration without increasing the viscosity to a point which makes it impractical of application to the needle punched fabric.

There has also been used for this purpose (i. e. to lock the fibers in place in the foundation fabric), a natural dispersion of rubber such as rubber latex, but this is objectionable for various reasons and impractical due to the high cost of the rubber hydrocarbon.

No satisfactory locking means has been found prior to the present invention which will have none of the objections above enumerated, and yet be capable of use in this process to produce a rug at nominal cost.

A paint film is too penetrating, takes too long to dry and is not flexible; a hot asphalt application is also too highly penetrating and will flow under constant pressure and does not afford sufficient traction; rubber latex is expensive and very troublesome to manipulate since fillers can be incorporated only with difficulty and the latex itself has insufficient body to prevent penetration through the fabric.

Asphalt or other bitumen-pitch type emulsion alone is unsatisfactory due to the asphaltic or similar properties of the dry film, which will tend to flow and penetrate through the fabric.

The problem is to obtain sufficient plasticity to facilitate application of the coating to the fabric without giving rise to penetration of the coating through the fabric.

It has been found that by properly compounding a stable emulsion, all these difficulties are overcome and at the same time there is produced a very inexpensive, waterproof, non-skid floor covering in which the fibers are locked in place in the foundation fabric, and cannot be separated therefrom by foot traffic, sweeping, beating, brushing, or vacuum cleaning.

As an illustration, the compounded emulsion used for the purpose may be formed as follows: To 400 pounds more or less, of previously prepared stable emulsion, add 200 pounds more or less of a non-plastic clay and 40 pounds more or less of red oxide or other suitable pigment. These proportions may be varied within considerable latitude.

This compound, thinned with water if necessary, may be applied to the needle punched fabric by means of a convenient doctor arrangement which serves to spread the compound in a film over the bottom face of the needle punched fabric. The thickness of the film may be predetermined by suitably adjusting the doctor. When this film has dried the fibers are firmly locked in place, and the fabric is now ready to be printed as desired on its top face, using any well-known type of printing apparatus.

The covering thus produced, in addition to being free from the defects inherent in the coverings of this type previously produced, is waterproof and possessed of fine non-skid properties (i. e. will not slide along the floor) and moreover the color designed on its exposed face, produced in the last stage of the process, is permanent and is not readily obliterated with reasonable usage. It has been readily found in fact, that after a rug produced by the process of the present invention had been in service a reasonable length of time, without any attention whatever, a simple sweeping readily removed all dirt and foreign matter from the wearing surface and effectively brought out the vari-colored design thereon.

While, as above stated, a rug produced as described, possesses positive anti-skid properties, these latter may be enhanced by incorporating with the emulsion compound, small amounts of ground cork, rubber dust, or the like. In addition there may be incorporated relatively small proportions of naphthalene or other vermin-repellent chemicals to impart moth-proof properties well known to the finished product.

It is to be observed that while the invention is herein described in connection with the use of a needle punched fabric requiring an interlocking of the punched fibers with the foundation fabric, it may likewise be carried

out in conjunction with fabrics other than those known as needle punched fabrics, and in fact with any fabric which is highly porous and which possesses other properties analogous to those characteristic of needle punched fabrics. Furthermore, when used in conjunction with needle punched fabrics, it is not essential that the foundation fabric be burlap, but it should be obvious that any coarsely woven fabric, or any fabric otherwise produced but resembling coarsely woven fabric, might be used in place of the burlap.

The invention may also be used to produce wall coverings, upholstering fabrics, etc., and is not limited to floor coverings.

The previously prepared emulsion prior to compounding heretofore referred to may comprise any desired type of stable emulsion. For instance, it may comprise the type of emulsion described and claimed in U. S. patent to Lester Kirschbraun No. 1,302,810, in which a solid material is reduced to heated fluid condition, and dispersed in an aqueous medium by means of an inert colloid such as clay. The use of the emulsion prepared in accordance with the disclosure of said patent is preferable, but it is obvious that a soap emulsion or any other type which can be made stable by suitable means might serve for the same purpose. In making the initial emulsion, any type of asphalt, pitch, resin, wax, or any combination of these may be used. The emulsifying agent may comprise finely divided materials which exhibit plasticity in paste form with water, such for example, as clay, metallic silicates, oxides, ochre, slate dust and the like.

In this type of emulsion the bitumen-pitch may comprise 45 to 55 percent of 30 penetration steam refined Mexican asphalt more or less, the emulsifying agent 3 to 4% more or less, and the balance, water. In a soap emulsion the saponaceous content may be from one-half to 2% more or less, and the bitumen from 60 to 75% more or less, with the balance water, depending upon the consistency desired. Such emulsion should be stabilized so as to permit the treatment heretofore described.

The upper and lower limit of the amount of non-plastic clay or the like which can be added is not a fixed quantity, but is dependent upon the type of emulsifying agent used as well as character of the emulsion. In the illustration given, I have cited non-plastic clay as a filler. It is obvious that any finely divided powdery material having the same general characteristics as clay may be utilized within the contemplation of the present invention.

The purpose of the red oxide is only to color the coating—the amount of this constituent more or less, determining the strength of the color. It is obvious that any other base in the

place of red oxide may be used to produce any desired color.

The dried film, it is to be noted, contains about half bitumen and half filler, more or less. It is characterized by being flexible, waterproof, non-adhesive, having marked non-skid properties, and the bituminous constituents do not flow under pressure so as to penetrate the fabric. By the term "bitumen-pitch" as used in the claims, I include all those substances heretofore referred to in the specification.

In the drawing Fig. 1 is a vertical sectional view indicating the fibers after they have been punched through a foundation fabric.

Fig. 2 is a similar view illustrating the application of the emulsion coating serving to lock the fibers to the foundation fabric.

It is understood, of course, that the illustrations in the drawing are somewhat exaggerated for the purpose of clearly illustrating the invention.

Fig. 1 is intended to indicate the fibers 1, after they have been punched through the foundation fabric 2, the fibers in this condition, of course, being insecurely associated with the foundation. Upon application of the coating of emulsion composition 3 to the structure of Fig. 1, the resultant film 3 serves to lock the fibers 1 to the foundation fabric 2, forming a continuous film, as shown, with which the fibers are securely bonded.

I claim as my invention:

1. A floor covering or like article comprising a woven or open mesh fabric, loosely felted fibers formed with one face of said fabric and extended through the interstices of the foundation and secured thereto by a continuous layer comprising the water-free film of a thickened bituminous emulsion.

2. A floor covering or like article comprising a woven or open mesh fabric, loosely felted fibers formed with one face of said fabric and extended through the interstices of the foundation and secured thereto by a continuous film of waterproofing material derived from a thickened emulsion thereof.

3. A floor covering or like article comprising a woven or open mesh fabric, loosely felted fibers formed with one face of said fabric and extended through the interstices of the foundation and secured thereto by a continuous film of waterproofing material derived from an emulsion thereof containing compounding ingredients to prevent penetration of said waterproofing material through the fabric.

4. A floor covering or like article comprising a woven or open mesh fabric, loosely felted fibers formed with one face of said fabric and extended through the interstices of the foundation and secured thereto by a continuous layer comprising the water free film of a bituminous emulsion containing com-

pounding ingredients to prevent penetration of the bitumen through the fabric.

5. As a new article of manufacture, a sheet of material comprising a base of woven or open mesh fabric, a multiplicity of strands of fibrous material extending from one side of said base and also passing through said base to its opposite side, and anchoring means for said strands on said opposite side of the base, comprising a deposit in situ from a thickened water dispersion of waterproofing material, said deposit forming a film, whereby flexibility of the base is unimpaired.

6. As a new article of manufacture, a flexible sheet material comprising a base of fibrous material and multiplicity of strands of fibrous material extending from one side of said base and also passing through said base to its opposite side, and a single anchoring means for securing said strands against displacement on said opposite side of the base, comprising a deposit in situ from a dispersion of waterproofing material of a consistency to prevent complete penetration through said base.

7. As a new article of manufacture, a flexible sheet of material comprising a base of fibrous material, a multiplicity of strands of fibrous material extending from one side of said base and also passing through said base to its opposite side and a single anchoring means for securing said strands against displacement on said opposite side of the base comprising a deposit in situ from a water dispersion of waterproofing material of the consistency to form a film on said base and a firm bond thereto and to said strands said dispersion being of a consistency sufficient to prevent substantial penetration through said base.

In testimony whereof I affix my signature.
HAROLD L. LEVIN.

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