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V. H. BODLE

2,349,236

CARPET

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Fig. 1.

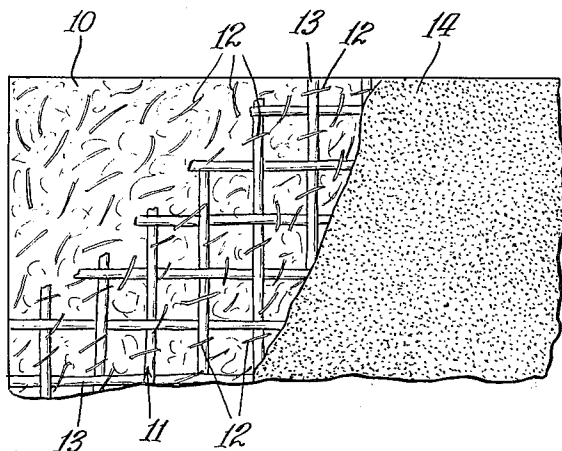


Fig. 2.

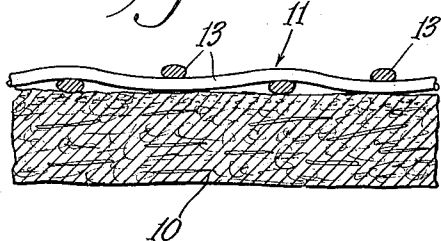


Fig. 3.

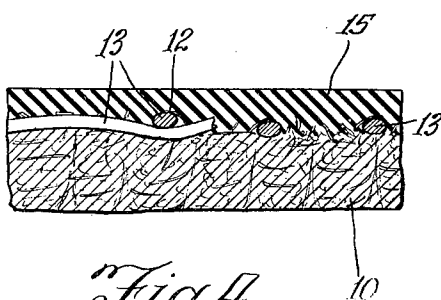
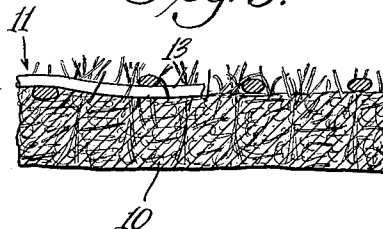


Fig. 4.

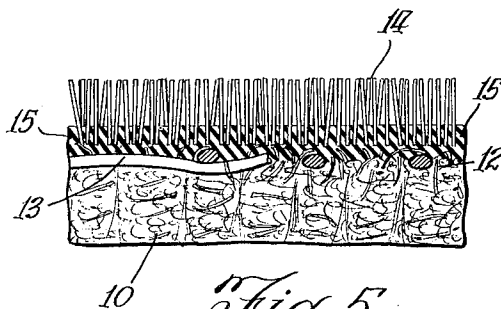


Fig. 5.

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UNITED STATES PATENT OFFICE

2,349,236

CARPET

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Application September 15, 1941, Serial No. 410,903

7 Claims. (Cl. 28-4)

My invention relates to floor coverings and has reference more particularly to the combining of different types of fibrous materials with each other and with a bonding medium to provide an improved floor covering having the appearance and advantages of a pile carpet.

Within comparatively recent years the search for new floor coverings, especially such as would be suitable for use in automobiles, has been particularly active. Among the requirements of a floor covering suitable for use in automobiles, are the following: it must be a good heat and sound insulator, capable of withstanding hard wear, unaffected by moisture, and should preferably have the feel underfoot of a good rug, and be capable of being easily cleaned. In addition to the above features, which may be considered as being inherent in the article itself, it should be adapted to quantity production in every stage of its manufacture down to the finished rug ready to place on the floor of the automobile or such other place as it may be used, and should preferably be very reasonable in price.

Now the prime object of my invention is to provide an improved cushioned floor covering which is pleasing in appearance, possesses good wearing qualities, and is economical in manufacture.

Another object is to provide a novel cushioned pile-like carpet which is composite but integrated by reason of the fact that the fibres of a felted cushion base are combined with the fibres of a simulated pile tread surface through a fabric in the presence of a bonding agent.

A further object of the invention is to provide a composite unitary floor covering in which fibres of a cushion base, individual fibres of a simulated pile tread surface, and an intermediate fabric are all substantially integrally bonded together in an intermingled zone within the body of the floor covering.

With these and other objects in view the invention comprises the novel combination and arrangement of elements and methods of producing the same hereinafter fully described, illustrated in the accompanying drawing, and particularly pointed out in the claims hereto appended, it being understood that various changes in the size, proportion and minor details of arrangement, and manners of effecting same, may be made, within the scope of the appended claims, without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In the drawing:

Fig. 1 is a fragmentary plan view, on a some-

what enlarged scale, showing a portion of a floor covering embodying the features of my invention, parts thereof being broken away to show the underlying construction;

Fig. 2 is an enlarged fragmentary sectional view through a portion of a cushioned base and overlying fabric; as they would appear in an early stage of the manufacture of the floor covering hereof;

Fig. 3 is a sectional view similar to Fig. 2 showing fibres of the base punched through the fabric in a further stage of manufacture;

Fig. 4 is a similar sectional view showing a layer of cement applied which bonds the fibres of the base to the fabric in a still further stage of manufacture and serves as the adhesive for attaching the pile fibres; and

Fig. 5 is a similar sectional view still further enlarged showing a fibrous surface applied in the final step of assembling the component parts of the product hereof.

Generally speaking, the novel floor covering or carpet hereof, as seen in Fig. 1, comprises a floor engaging cushion base 10 of substantial thickness formed of matted or felted animal and/or vegetable fibres, a reinforcing layer 11 of fabric applied thereover in a manner so that fibres or strands 12 of the pad 10 penetrate and extend through the reinforcing fabric and are interengaged and enmeshed with the threads 13 thereof, and a tread layer simulating a pile surface and composed of individual upstanding fibres 14 of appreciable length applied over the reinforcing layer 11 by means of cement, preferably a rubber cement. For the purpose of clarity of illustration, this cement is not shown in Fig. 1 because actually, in the finished product hereof, there is no clearly defined distinguishable layer of cement, as the fibres 12 of the base, the threads 13 of the fabric layer, the ends of the pile fibres 14, and the cement binding agent all become one substantially integral intermingled mass or zone within the body of the carpet. The cement for binding the component elements of the present carpet into one integrated structure or mass is shown, however, in exaggerated fashion, at 15 in Figs. 4 and 5 of the drawing. Thus, from an inspection of the latter figure particularly, it will be readily appreciated how the strands or fibres 12 of the base pad 10 penetrate the fabric 11 and are enmeshed with the threads 13 thereof and are also commingled and entangled with the ends of the pile fibres 14, the whole zone of such enmeshing and commingling being permeated and integrally bonded by the cement 15.

The fabric 11 may be of any type suitable for the purpose, a coarse open mesh fabric such as burlap or Osnaburg being preferred, and the fibrous base 10 is punched thereto in well known manner so that strands or tufts of the fibres of the base 10 project through and above the fabric 11 to bond therewith and to the cement and fibrous surfacing that is provided on the top of the fabric. Obviously with an open mesh fabric 11, the attachment of the fibrous base does not depend entirely upon the strands or tufts thereof that are punched through the fabric 11 as the cement 15 also bonds to the base through the interstices of the fabric and the latter accordingly is cemented to the base as well as combined therewith by the punching.

For the purpose of illustrating a manner in which the above described floor covering may be manufactured, Figs. 2 to 5, inclusive, show structures or arrangements resulting from various stages in the manufacturing procedure. Starting with Fig. 2, a relatively coarse open weave fabric 11, which is preferably burlap of a weight of about 6 ounces per square yard but may conveniently be other suitable material, such as paper twine cloth or Osnaburg, is applied to one side of the cushion base 10 comprising a padding of matted or felted fibres. These fibres may be of animal or vegetable origin, or a mixture thereof, but are preferably vegetable fibres as exemplified by the well known jute felting.

This fibrous base 10 is punched to the fabric 11 in a manner known in the art, with the result, as seen in Fig. 3, that fibres 12 of the base 10 are punched or needled through the interstices of the fabric 11 in interengagement with the threads 13 thereof. This punching of the fibres through the fabric 11 produces on the fabric side of the base a somewhat fuzzy or tufted fibrous surface which is excellently adapted to receive a coating of cement or the like.

The coating of cement, representing the next manufacturing stage in the preferred practice, is seen in somewhat exaggerated fashion at 15 in Fig. 4. It can be applied in any suitable manner as by spraying or by the use of a doctor blade, not shown, in a well known manner. The use of a doctor blade or comparable wiping means in the application of the cement has a desirable action in smoothing the upstanding punched fibres 12 and causing them to better overlie and engage the strands 13 of the fabric. The cement used for this purpose is preferably composed of a rubber compound in a suitable volatile solvent and may contain one or more resins to provide a soft strongly adhesive coating.

While the cement coating is still soft I distribute over the cemented surface of the base individual cut fibres 14 of appreciable length, as distinguished from the comminuted or substantially powdered flock of commerce, and preferably employ fibres which are relatively straight and of some body, such as goat hair or the like.

The fibres are preferably applied to the cemented surface 15 by impelling them with some force in an endwise direction against and into the cemented surface so as to be actually commingled with the fibres 12 punched up from the base, as clearly seen in Fig. 5. A method of so applying fibres to a cemented surface is disclosed in the co-pending application Serial No. 310,112, filed December 20, 1939, of Virgil H. Bodle and George W. Blair, assigned to the same assignee as the present application. As another means of depositing the fibres on the cement coated base

I may sift or otherwise loosely distribute the fibres on the surface while simultaneously rapidly vibrating the base material in a direction perpendicular to its face as by means of mechanically operated beaters of a type which are also described in the above mentioned co-pending application.

After a required application of the fibres 14 is made to the adhesive coated surface 15, the material is preferably heated in a suitable manner to evaporate the volatiles from the cement, and to vulcanize the rubber content thereof when a rubber cement is employed.

While the general appearance of the fibres to one standing on the rug, or observing it from the normal distances in excess of a few feet, is similar to that of a pile carpet with entirely upstanding pile, in actual structure, the fibres of my new product do have some divergence from each other in the manner indicated in Fig. 5.

By forcibly tearing loose a portion of the flocked upstanding fibres from the fabric and felt base, fibres 12 of the base are seen to be drawn up through the interstices of the fabric while such fibres of the base material and portions of the fabric threads 13 are seen projecting from the ruptured surface of the cement, showing that there is actually an embedded bonding of these fibres in the cement coating. Since the fibres 14 of the surfacing material are also bonded in the cement there results a product which for all practical purposes is a unitary structure.

The jute or cattle hair felt and the open weave fabric used in making my new floor covering are both extremely inexpensive products and the cut hair or fibre of the surfacing material is likewise low in price. While the cement used is preferably of high quality, it is required in such small amounts as to add but little to the cost of the finished product.

My new floor covering is easily fabricated in large quantities, being preferably made in long strips which can be easily rolled or otherwise handled as desired. The material can be easily cut to desired shapes and sizes and applied, and requires no binding on cut edges since there is no danger of raveling due to the binding action of the cement.

While I have illustrated and described a preferred form of my invention, I am aware that various modifications can be made therein without departing from the spirit of my invention, the scope of which is to be determined by the appended claims.

I claim as my invention:

1. A floor covering comprising a fibrous cushion base, a substantially upstanding fibrous tread surface simulating pile fabric secured thereto, an interposed woven fabric having fibres from the base penetrating into and through the fabric, and an adhesive bond within the body of said floor covering and having fibres of the tread surface, of the base, and the fabric combined therewith.

2. A floor covering comprising a ply of open woven fabric, a ply of felted fibres at one side of the fabric and having strands thereof extending through the interstices of said fabric, an adhesive coating over the opposite side of said fabric and embracing said strands, and pile material carried by said coating, said pile material being individual upstanding fibres having ends

commingled with said strands and embedded in said coating.

3. A floor covering comprising a ply of open woven fabric, a ply of felted fibres at one side of the fabric and having strands thereof extending through the interstices of said fabric, pile material at the opposite side of said fabric, said pile material being individual upstanding fibres having ends commingled with said strands, and a bonding agent permeating the zone of such commingling and the fabric.

4. The method of making a floor covering which comprises punching a padding of felted fibres to one side of an open weave fabric so that fibres thereof project through the fabric out the other side thereof, spreading a coating of a cement containing rubber and a solvent on the latter side of said fabric, applying a layer of upstanding individual fibres in simulation of pile fabric in partial endwise embedded engagement in said cement, and subjecting the product to heat to dry the cement and vulcanize the rubber component thereof, said cement serving to lock the punch-through fibers to the fabric and to anchor the pile fibers.

5. The method of making a floor covering which comprises punching a padding of felted fibres to one side of an open woven fabric, spreading a coating of cement on the other side of said fabric, and impelling individual fibres with sub-

stantial force in an endwise direction against and into said cement whereby their ends are commingled with said punched through fibres within said cement.

6. The method of making a floor covering which comprises punching a felted fibrous base to an open woven fabric so that fibers of the base penetrate through the fabric, spreading a rubber adhesive over said fabric to saturate the fabric and the penetrant fibers, impelling individual fibers with substantial force in an endwise direction against and into said adhesive while vibrating the assembly, whereby the ends of said fibers and the penetrant fibers of the base are commingled in the zone of the adhesive, and subjecting the product to heat to cure the adhesive.

7. A floor covering comprising a felted fibrous base, a woven fabric surmounting said base and needled thereto whereby a plurality of fibers from said base extend through said fabric to the upper surface thereof, a layer of vulcanized rubber cement over the upper surface of said fabric embracing the fibers that extend through said fabric and vulcanized to said fabric so as to lock the same to said fibers, and a tread surface of individual upstanding pile fibers having their ends embedded in said cement and commingled therein with the fibers extending through said fabric from the base.

VIRGIL H. BODLE.