

April 26, 1938.

R. H. JOHNSON

2,115,581

FELT CARPET OR RUG AND METHOD OF MAKING THE SAME

Filed July 5, 1935

FIG. 1.



FIG. 2.

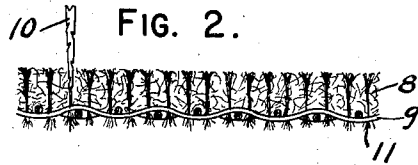


FIG. 3.

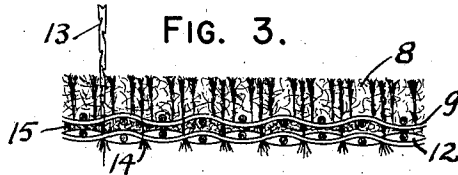


FIG. 4.



FIG. 5.

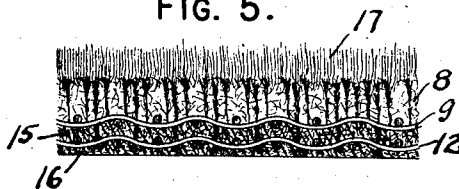
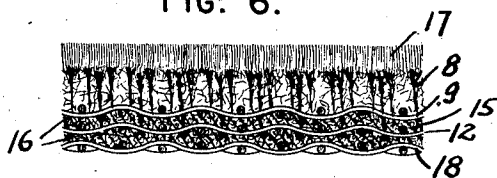


FIG. 6.



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FELT CARPET OR RUG AND METHOD OF
MAKING THE SAME

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6 Claims. (Cl. 28—4)

The invention relates to felt carpets or rugs and to a method of making the same.

Where carpets or rugs are made by the needling or punching method of feltable fibres the body of the material is quite elastic and ordinarily does not hold its shape as well as the usual woven textile carpets. The main object of the present invention is to provide a method of making felt carpets or rugs which will hold their shape. More particularly according to the present invention the felt bat is needled to a reinforcing fabric, such as burlap, and then needled to a second layer of reinforcing fabric disposed adjacent the first layer with a layer of needled fibres therebetween and forming with the bottom fabric an absorptive area for a sizing and binder which firmly anchors the fibres at their base and gives body to the material, the needled portion between the fabrics also preventing ready penetration of the sizing and binding composition beyond the first fabric layer and thus leaving the main body of feltable fibres in a condition best suited for producing a relatively heavy nap or pile which gives the product the appearance and feel of woven carpet. After the napping operation a third layer of fabric is cemented or adhesively secured to the previously needled and treated material to form the finished product whose top surface has the appearance and feel of woven carpet and whose body portion is relatively fixed against shrinking or stretching and will hold its shape indefinitely.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawing:

Fig. 1 is a view showing the bat of feltable fibres positioned on a fabric base preparatory to the first needling operation;

Fig. 2 is a view of the materials shown in Fig. 1 after the first needling operation;

Fig. 3 is a view showing the step of needling a second fabric base to the base of the previously needled material;

Fig. 4 is a view showing the material after treatment with a sizing and binder;

Fig. 5 is a view showing the material after the napping operation;

Fig. 6 is a view showing the completed material after the nap or pile has been sheared and a reinforcing fabric base has been applied to the previously needled and treated material.

According to the invention any suitable animal or vegetable fibres or mixtures of such fibres are formed in the usual manner in a bat 8 of any

desired thickness which is laid over or deposited on a reinforcing fabric base 9, such as burlap of any suitable mesh, these parts being shown in Fig. 1. In this condition the material is fed into a needling loom or punching machine, with the needles 10 acting from the top side, and by this operation fibres of the bat are interlocked with each other and with the fabric base as shown in Fig. 2. By this operation a substantial proportion of the feltable fibres are arranged to extend substantially normal to the surface of the top layer and some of the fibres, indicated by the numeral 11, project through the fabric base.

Thereafter, a second fabric layer 12 of burlap or other suitable material is positioned beneath the previously needled material and the parts thus arranged are fed into a needling loom or punching machine, with the needles 13 acting from the top side, and by this operation fibres of the bat are further interlocked with each other and some of the fibres are interlocked with one or both of the fabric bases or layers 9 and 12 as shown in Fig. 3. By this operation the feltable fibres are further arranged to extend substantially normal to the surface of the top layer and some of the fibres, indicated by the numeral 14, project through the lower fabric layer 12. It is also to be noted that some of the fibres 11 form a fibrous layer or area 15 between the fabric layers 9 and 12.

Thereafter, the base portion or bottom side of the material is treated to a sizing and binder which penetrates to the first fabric layer 9, and in this connection the fibrous layer or area 15 is of material assistance in checking the penetration of the sizing and binder materially beyond said first layer 9 as shown in Fig. 4. This binder and sizing is designated by the numeral 16 and is adapted to give the felt body life so that it may be readily rolled and unrolled and when unrolled will maintain itself in a flat condition on the floor and will not curl up at the edges. The preferred binder is a mixture of a suitable gum and a thin rubber solution. The gum is preferably a tapioca gum and the rubber a natural or artificial dispersion of rubber in an aqueous liquid. A pigment or dye for coloring the product may also be added to this mixture. The mixture may contain about one part gum to about two and one-half parts of the rubber dispersion, and it may in the proportion of one part solid rubber to four parts of water be applied to the felt body by using pick-up or sizing rolls. It will, of course, be understood that the rubber concentration may vary under different conditions and be greater

or less than that specifically mentioned, for example, this concentration may vary from 10% to 30% of the mixture.

To secure greater penetration of the binder, a wetting agent, such as sulfonated oils, saponin, sodium sulfanilate, may be mixed with the rubber dispersion. Where a vulcanized product is desired, the binder may have a suitable vulcanizing agent added to it and also a suitable accelerator if vulcanizing at low temperatures is desired.

The body thus formed is next subjected on the uncoated side and on the side from which the needles entered to the action of a suitable napping machine which acts to raise a heavy or thick nap or pile formed by upwardly projecting portions 17 of some of the fibres, as shown in Fig. 5, which is preferably trimmed to a substantially uniform thickness or height, as shown in Fig. 6, and imparts to the punched product the appearance and feel of woven carpet. The interlocking of the fibres provides a good foundation for anchoring the napped fibres, and these napped fibres for the most part extend substantially normal to the top of the fabric body. The feltable fibres are preferably animal hair, but other fibres such as hemp, jute, or other vegetable fibres might be used or mixed with the animal hair if desired.

The material thus prepared is preferably then subjected to a suitable stretching operation more severe than it will in most cases ever get in service and to this pre-stretched material a base layer 18 of suitable material is secured by suitable adhesive, as for example rubber cement. This base layer 18 may be a pre-shrunk and stretched burlap either with or without a sizing. The finished product is shown in Fig. 6.

I desire it to be understood that this invention is not to be limited to any particular form or series of steps except in so far as such limitations are included in the claims.

What I claim as my invention is:

1. The steps in the method of making carpets or rugs of feltable fibres which comprises needling a fibrous bat to a woven fabric base, needling this previously needled material directly to another woven fabric base with the base fabrics adjacent each other and projected fibres from both needling operations between them, applying a sizing and binder to the needled material from the base fabric side and to a depth not materially greater than the first base fabric, and napping the top surface of the needled fibres.

2. The method of making carpets or rugs of feltable fibres which comprises needling a fibrous bat to a woven fabric base, needling this previously needled material directly to another woven fabric base with the base fabrics adjacent each other and projected fibres from both needling operations between them, applying a sizing

and binder to the needled material from the base fabric side and to a depth not materially greater than the first base fabric, napping the top surface of the needled fibres, and adhesively securing a shape-maintaining base layer to the binder-treated side of said needled and napped material.

3. The method of making carpets or rugs of feltable fibres which comprises needling a fibrous bat to a woven fabric base, needling this previously needled material to another fabric base with the base fabrics adjacent each other and projected fibres from both needling operations between them, applying a sizing and binder to the needled material from the base fabric side and to a depth not materially greater than the first base fabric, napping the top surface of the needled fibres, stretching the needled and napped material, and adhesively securing a base layer of pre-stretched material to the binder-treated side of said needled and napped material.

4. A pile fabric which comprises a plurality of superimposed woven base fabric layers needled directly together, a bat of fibrous material needled to said base layers with needled fibers from said fibrous material enmeshed between said layers, a binder coating on the base side of said fabric penetrating to the upper of the fabric layers, the fibers between said base layers acting to check penetration of said coating beyond said fabric layers, the uncoated side having a relatively large proportion of surface fibers projecting therefrom to form a thick pile or nap.

5. A pile fabric which comprises a plurality of superimposed woven base fabric layers needled directly together, a bat of fibrous material needled to said base layers with the needled fibers from said fibrous material enmeshed between said layers, a binder coating on said fabric layers penetrating to the upper of the fabric layers, the fibers between said base layers acting to check penetration of said coating beyond said fabric layers, the uncoated side having a relatively large proportion of surface fibers projecting therefrom to form a thick pile or nap, and a base layer secured to the coated side of said superimposed base fabric layers.

6. A pile fabric which comprises a plurality of superimposed woven base fabric layers needled directly together, a bat of fibrous material needled to said base layers with the needled fibers from said fibrous material enmeshed between said layers, a binder coating on said fabric layers penetrating to the upper of the fabric layers, the fibers between said base layers acting to check penetration of said coating beyond said fabric layers, the uncoated side having a relatively large proportion of surface fibers projecting therefrom to form a thick pile or nap, and a woven base layer secured to the coated side of said superimposed base fabric layers.

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CERTIFICATE OF CORRECTION.

Patent No. 2,115,581.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 13, for "reinforcng" read reinforcing; page 2, second column, line 10, claim 3, before the word "fabric" insert woven; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of June, A. D. 1938.

Henry Van Arsdale, .

Acting Commissioner of Patents.

(Seal)