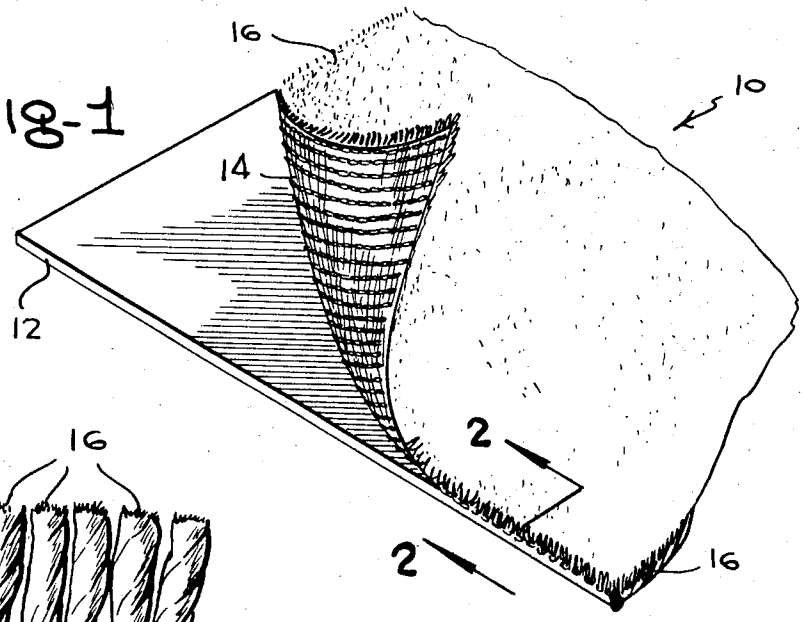
June 2, 1970 J. E. JORDAN 3,515,622

LAMINATED CARPET OR MAT

Filed Sept. 19, 1967

Fig-1



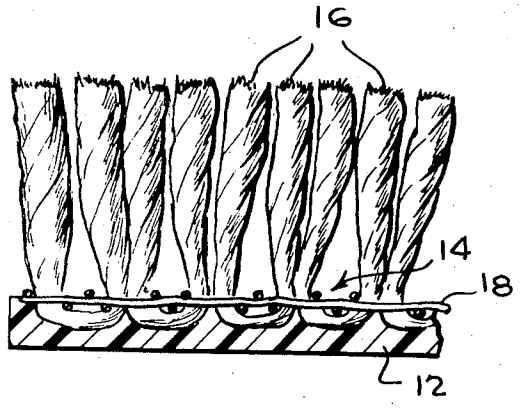
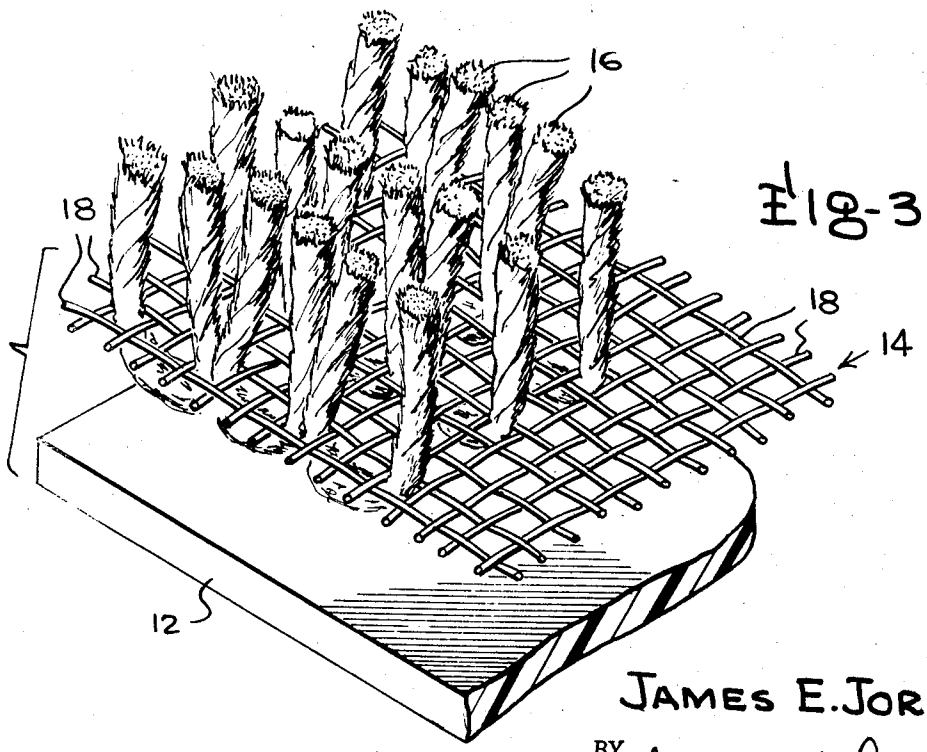


Fig-2

Fig-3



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LAMINATED CARPET OR MAT

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U.S. Cl. 161—66 7 Claims

ABSTRACT OF THE DISCLOSURE

A dimensionally stable mat or carpet comprising a base sheet formed from a vinyl polymer such as polyvinyl chloride, polyvinyl acetate, polyvinylidene chloride, polyvinyl acetal and polyvinyl butyral; a netting of fiber glass threads woven 20–60 per inch square, each thread being at least 10 mils thick and having a coating on each thread of a vinyl polymer as above and having tufted therein yarns such as wool, cotton, polyamides such as nylon, polyesters such as polyethylene terephthalate and polyalkylene materials such as polypropylene, the netting with the yarns being embedded into the vinyl base sheet at 250–500° F., to form a weather resistant mat suitable for indoor or outdoor use and able to withstand commercial laundering.

This invention relates generally to a unique carpet for use indoors or outdoors under any weather conditions. More particularly, the present invention relates to a carpet which is dimensionally stable and will lie flat without rippling or distortion.

Carpets having a vinyl base for use indoors or outdoors have been known in the past and are presently on the commercial market. Generally these carpets consist of puffs of yarn which are held together in a fabric and are secured in some manner to a vinyl base to lend flexibility and good wear characteristics to the carpet. Under severe wear conditions, such as heavy traffic or outdoor weather conditions, the carpets previously known tend to ripple or distort due to shrinking and from other forces acting upon the carpet. The carpets of the prior art also are not suitable to be laundered in the commercial laundry machines without the severe shrinking or rippling or other distortion that severely lessens their useful life.

With the advent of various synthetic fibers for use as yarns in the mats, the carpets so made were able to withstand heavier traffic and would clean well under vacuuming and spot cleaning, but could not be effectively commercially laundered, generally for the reason that the bonds securing the yarns to the vinyl base would not withstand the commercial laundering. Also, the fabric, if any, holding the yarns onto the vinyl base would tend to shrink, or lose shape, forcing a dimensional change in the carpet and resulting in the ripples or other size distortion that renders further use of the carpet undesirable.

It is the principal object of the present invention to provide a dimensionally stable mat or carpet which can withstand the rigors of the weather conditions, as well as commercial laundering.

This invention also has as an object the provision of a dimensionally stable mat in which the yarns are permanently tufted into a fiber glass netting both of which are then embedded into the vinyl base.

Another object of the present invention is to provide a means for adhering the tufted yarns to the vinyl base and to the fiberglass netting by means of a vinyl polymer coating upon the threads of the netting.

A further object of the present invention is the provision of a dimensionally stable mat which permits the use of substantially any yarn for forming a mat but which

will retain the shape of the base and fabric within which the yarns are tufted.

These and other objects of the present invention will be more apparent upon careful study of the following specification and accompanying drawing in which:

FIG. 1 is a perspective view partly broken away of the dimensionally stable mat of the present invention;

FIG. 2 is a cross-sectional view partly broken away taken along the lines 2 of FIG. 1 and illustrating the embedding of the fiber glass netting and yarns into the vinyl base sheet;

FIG. 3 is a perspective space view of the yarns tufted into the fiber glass netting prior to the embedding of the fiber glass netting and the base of the yarns into the base sheet by the fusing process.

In FIG. 1 of the drawing there is illustrated the composite article forming the dimensionally stable mat or carpet shown, generally at **10**. The mat is composed essentially of a base sheet **12** of a vinyl polymer into which is embedded a fiber glass netting **14**. The mat is also provided with a plurality of yarns **16** tufted into the fiber glass netting.

The base sheet **12** is preferably formed from a vinyl polymer such as polyvinyl chloride, polyvinyl acetate, polyvinylidene chloride, polyvinyl acetal and polyvinyl butyral, as well as copolymers of any of these vinyl polymers. In particular, a copolymer of vinyl chloride and vinyl acetate in which the amount of vinyl acetate ranges from 1 to 50%, preferably 15%, may be used in accordance with the present invention. Such base sheets have a water absorption of less than 1% in 24 hours, and good light and heat stability, as well as good aging characteristics, making them preferred at the base sheet of the present invention.

The netting **14** is one of the unique aspects of the present invention in that it is a woven fiber glass netting composed of fiber glass threads **18** which should be at least about 10 mils in diameter and which are woven in such manner as to produce about 20 to 60 fiber glass threads per square inch. Preferably, the weave pattern should have 10 to 30 weft threads per square inch.

It has been found that the fiber glass netting must be coated with a vinyl polymer coating, preferably selected from those materials described above for forming the base sheet. It is not necessary that the coating on the fiber glass threads be of the same material as the base sheet, but it has been found preferably to utilize a polyvinyl chloride-polyvinyl acetate coating. The thickness of the coating is not critical to the present invention and may be of the thickness of .1–3 mils thickness.

The purpose of the coating of the vinyl polymer upon the fiber glass netting is to provide the means for securely bonding the netting and the tufted yarns to the vinyl polymer base sheet. At a temperature in which the coating on the fiber glass threads and the vinyl base sheet softens, a good and secure bond will be produced between the fiber glass netting and the vinyl base sheet.

The yarns that may be tufted into the fiber glass netting are those commonly used for carpets and may include the well known natural fibers cotton and wool, as well as any of the synthetic fibers such as the polyamides which includes nylon, the polyesters which includes polyethylene terephthalate or any of the polyalkylene materials such as polypropylene, as well as mixtures and copolymers of these fibers. These fibers may be tufted into the fiber glass netting in any conventional manner, it being only important that the lower portion of the yarns extend below the fiber glass netting as shown in FIG. 2 in order that it may be embedded with the netting into the vinyl base sheet.

To form the composite dimensionally stable mat of the present invention the fiber glass netting is woven with

about 20 warp and weft threads each in a conventional manner and the entire netting is dipped or sprayed or otherwise coated with a polyvinyl polymer coating, preferably one in which polyvinyl chloride predominates about 3–5 to 1 over polyvinyl acetate. A coating of 1 mil thickness of the polyvinyl coating upon dipping into a hot solution of the polyvinyl chloride-polyvinyl acetate copolymer is adequate for the present invention and provides the necessary bonding between the fiber glass netting and the vinyl base sheet.

Thereafter the tufting is accomplished in the usual manner through the fiber glass netting and the netting with the major portion of the yarn uppermost is superposed over a vinyl base sheet of a copolymer polyvinyl chloride and polyvinyl acetate.

To achieve the embedding of the fiber glass netting and the yarns into the base sheet it is important to keep the base sheet and the coating on the fiber glass netting at a temperature between 250–500°, preferably 375°, for a time range of between 2 and 10 seconds, preferably 3–8 seconds in order to soften and make plastic the vinyl coating on the netting as well as the polyvinyl base sheet. After a sufficient time has elapsed the weight of the netting with the tufted yarns alone will embed itself into the base sheet. However, it is anticipated that such embedding may also occur upon the application of pressure to the upper surface of the yarns in order to form a finished carpet.

A carpet made in accordance with this invention will possess a dimensional stability far surpassing that which characterizes the presently known carpets and when yarns such as nylon or polypropylene are used for tufting the fiber glass netting the carpet is suitable for outdoor use. The carpet will not shrink or stretch and will not ripple after heavy wear even with repeated commercial laundering.

From the foregoing detailed description, it will be evident that there are a number of changes, adaptations, and modifications of the present invention which come within the province of those skilled in the art. However, it is intended that all such variations not departing from the spirit of the invention, be considered as within the scope thereof as limited solely by the appended claims.

I claim:

1. A dimensionally stable mat comprising a base sheet formed from a vinyl polymer, a netting of woven fiber glass threads, each said fiber glass thread being coated with a film of a vinylpolymer, a plurality of yarns tufted into said netting, said netting and a first portion of said yarns adjacent said netting being embedded into said base sheet, a second portion of said yarns protruding above said netting and said base sheet.

2. The mat of claim **1**, including said base sheet being formed from a vinyl polymer selected from the group consisting of polyvinyl chloride, polyvinyl acetate, polyvinylidene chloride, polyvinyl acetal and polyvinyl butyral.

3. The mat of claim **1**, including each of said fiber glass threads, being at least 10 mils thick and woven to form at from 20–60 threads per square inch.

4. The mat of claim **1**, including said netting and yarns being fused at temperature from 250–500° F. to said base sheet.

5. The mat of claim **1**, including said film being selected from the group recited in claim **2**.

6. The mat of claim **1**, including yarns being selected from the group consisting of wool, cotton, polyamides, polyesters, polyalkylene.

7. The mat of claim **1**, including said base sheet being formed from a vinyl polymer selected from the group, consisting of polyvinyl chloride, polyvinyl acetate, polyvinylidene chloride, polyvinyl acetal and polyvinyl butyral, each of said fiber glass threads being at least 10 mils thick and woven to form at from 20–60 threads per square inch, said netting and yarns being fused at temperatures from 250–500° F. to said base sheet, said film being selected from the group recited in claim **2**, and said yarns being selected from the group consisting of wool, cotton, polyamides polyesters, and polyalkylene.

References Cited

UNITED STATES PATENTS

2,675,337	4/1954	Walker et al.	161—66 XR
3,075,867	1/1963	Cochran	161—66 XR
3,238,595	3/1966	Schwartz et al.	161—66 XR
3,457,135	7/1969	Sington	161—66

FOREIGN PATENTS

830,290	3/1960	Great Britain.
916,492	1/1963	Great Britain.

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U.S. Cl. X.R.

112—410; 156—72; 161—67, 93