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[54] **COATED WOVEN TEXTILE PRODUCT AND PROCESS THEREFOR**

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[63] Continuation of Ser. No. 45,938, June 12, 1970, abandoned.

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[58] **Field of Search** .... 161/67; 156/72; 117/76 T, 90, 138.8 A, 161 UH, 161 UZ

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[57] **ABSTRACT**

In a primary backing woven from synthetic yarns for tufted fabrics and other products, such as carpet and the like, an enhancement in the carpet and/or tufted fabrics tuft raveling resistance capabilities is obtained when the backing is coated with a polymeric substance which effectively reduces such tuft raveling to an acceptable degree. The preferred coating material is a copolymer of ethylene vinyl acetate, and is applied to the backing by any known method including spraying, immersing, brushing or rolling.

19 Claims, No Drawings

COATED WOVEN TEXTILE PRODUCT AND PROCESS THEREFOR

This is a continuation of application Ser. No. 45,938 filed June 12, 1970 now abandoned.

The present invention relates to improvements in the preparation of tufted products, e.g., carpets or the like, which include a backing, partially or wholly comprised of a woven fabric.

More particularly the present invention relates to tufted products of the type referred to wherein the woven backing is coated by known methods which renders the finished, tufted product highly resistant to tuft raveling when such tufted product is applied to its end use as a carpet or floor covering.

Carpeting or other forms of tufted products have ever increasingly been provided in the last few years with woven backings comprising yarns of synthetic thermoplastic materials such as the polyolefins, polyethylene and polypropylene. These backings of woven polyolefin yarns are, in most instances woven from yarns of substantially ribbon-like character, especially in the warp. The backings, after weaving are fed into a multi-needle tufting machine which sews or otherwise inserts tufts of face yarn, into the backing. The face yarns may be any of the materials above referred to or made from nylon, acrylic fibers or natural fibers. After tufting the tufted fabric thus produced has applied to it a lamination of latex on the bottom, or back side, thereof, to retain the tufts and "lock" them in position. Applying the latex is a high temperature operation and on occasion has been found to adversely effect the material of the backing. Also when the finished fabric is used as a rug or carpet, and is cut, as is often necessary, the tuft lines along the cut edge may tend to ravel, especially when the cuts in the carpet are made parallel to the tufting stitch line. It is the usual practice in tufting to tuft the face yarns in such a way that the stitch line is most often parallel to the warp yarns of the primary backing fabric into which the pile yarn is tufted.

Tufted pile fabrics produced from woven polyolefin backings, as noted above, have exhibited in the past, an undesirable tendency to ravel at a cut edge paralle to the tufting stitching line. This ravelling occurs when a force is applied perpendicular to the stitch line at the cut edge. Since in tufting the stitch line in carpets is most often parallel to the warp yarns of the primary backing fabric into which the face or pile yarn is tufted, the edge row of stitches along a cut tends to pull out sideways as the warp yarns of the backing fabric slide across the fill yarns of the backing. Thus when cuts are made in installation of the rug, such as the so-called "wall-to-wall" application, and these cuts are made parallel to the rows of tufting stitches tuft ravelling is most likely to occur. Seams made after such cuts tend to show wear prematurely especially when the installation, and/or seam is made by workmen who have not yet acquired the greatest of skill. Thus what commonly results is a backing having unacceptable tuft ravel resistance.

Carpets provided to the trade usually have a rubber latex (adhesive) coating applied to the back of the tufted pile fabric as noted above. While this, by itself, tends to reduce tuft ravelling with woven backings of the type in which this invention is concerned, it, the latex lamination procedure, must be performed properly, or tuft ravelling resistance of the finished carpet will be unacceptable, even for commercial or contract grade carpets. Tuft ravelling can thus be minimized if latexing is performed in a highly skillful and therefore more expensive manner;however without such high skill, the finished carpet having a woven polyolefin backing of the type herein described, most likely will have unacceptable tuft ravel resistance even for minor commercial operations. Other prior art solutions to these problems have been the use of a nonwoven backing into which the face yarn is tufted, since nonwoven backings inherently have excellent resistance to tuft ravelling. Woven backings would likewise be suitable for such end uses in commercial grade carpet if such tuft ravel resistance could be significantly improved. Woven backings have certain advantages over nonwoven, as for example a tufted pile fabric with a nonwoven backing exhibits undesirable greater stretching when tensioned, because its modulus of elasticity is considerably lower than a woven backing carpet, which, as will be seen, is important in later steps of carpet manufacturing.

Accordingly, it is an important object of the present invention is provide a backing woven from yarns of synthetic, thermoplastic materials wherein the tuft ravelling resistance is significantly improved over prior art backings. Another object of this invention is to provide a woven backing for tufted pile fabrics wherein the backing receives a coating which effectively stabilizes the fabric (i.e., decreases its "sleaziness") by bonding the yarns and reduces tuft ravelling of the finished carpet thereby providing an acceptable commercial product. It is still another object of this invention to provide a woven backing of the character described wherein the coating applied is selected from a group of materials, the most preferred one being a co-polymer of ethylene and vinyl acetate.

It is a still further object of this invention to provide a woven backing for carpet products and the like wherein said backing has applied to at least one side thereof a lubricant to improve it strength retention characteristic after tufting.

According to the invention a primary backing for a carpet product is woven from yarns of synthetic plastic. The synthetic plastic is comprised of any of those plastic materials capable of formation into weavable yarns, including, but not limited to, polyethylene, polypropylene ethylene/propylene copolymers, copolymers of other alpha-olefins, polyesters, polyamides, cellulose acetate and polyvinyl chloride.

The backing is coated with a polymeric compound which is dried and cured, after which a lubricating material can, if desired, be applied, usually to one side. Alternatively the lubricant can be applied before coating, or to the yarns, either the warp or the fill or both, prior to weaving. A still additional alternative is to apply both the coating and the lubricant simultaneously, either as a mixture of same, or separately onto the backing.

The amount of lubricant needed will vary according to the lubricant used, the primary backing to be treated and the type of tufting operation. In general it has been found that the specified fabric strength can be obtained by treating the synthetic plastic primary backing material (for example primary backing materials like those disclosed above) prior to tufting with at least so much lubricant that the tufting needles are enabled to pierce the individual yarns in the backing fabric without rupturing or shattering them. Generally from 0.2 to 12 percent, and preferably 0.6 to 8 percent by weight, of the lubricant will be used.

The lubricant used can be any lubricating substances that does not react with, have solvent action on, or otherwise materially affect the properties of the synthetic plastic yarns in the primary backing. Suitable materials include, for example mineral oils; ethoxylated higher fatty acids (i.e., fatty acids having eight or more carbon atoms) more commonly known as polyethylene glycol esters, e.g. polyethylene glycol linoleate, polyethylene glycol stearate, polyethylene glycol oleate polyethylene glycol laurate, ethoxylated mixtures of the fatty acids in naturally occurring higher fatty acids in various vegetable; e.g., castor oil and ethoxylated castor oil and marine oils; various low molecular weight waxes, both natural and synthetic; and a wide variety of well known, non-ionic surface active agents other than the ethoxylated higher fatty acids previously mentioned, e.g., those sold under the trade names "Pluronic," and "Carbowax". "Pluronic" and "Carbowax" are Registered Trade Marks. Preferably the lubricant should be a relatively low viscosity liquid either as such or when in aqueous emulsion, so as to provide easy application and spreading. The most especially preferred lubricants (based on experimental results to date) are mineral oil. ethoxylated castor oil, and the polyethylene glycol esters, especially polyethylene glycol oleate having an average of 15 oxyethylene —(—CH_2CH_2O—)— groups per molecule commercially sold under the tradename "Nopcostat 2152-P". "Nopcostat" is a Registered Trade Mark. Another material useful as a lubricant is a mixture of calcium stearate and silicone oil, the latter being present in minor amounts.

The thus treated backing, now possessing ample strength retention after tufting, is coated before tufting with one of a number of materials, such as the dispersions in water, or other agents or polyethylenes, carboxylated styrene polybutadiene rubbers and acrylic latexes in addition to the ethylene vinyl acetate copolymer, which have been found to survive the impact imparted by the tufting needles. Backing strength is needed also because subsequent operations on the fabric such as dyeing, drying and latexing above referred to tend to weaken the fabric resulting in an unsatisfactory carpet product. For example, a dispersion of polyethylene in water, with a small amount (0.05 percent) of a 2% gel agent, a styrene maleic anhydride polymer and a latex was found to provide a tufted pile fabric of good tuft ravel resistance with little or no loss in tufted fabric strength as compared to an uncoated, lubricated woven polyolefin backing.

Similarly latexes of carboxylated styrene butadiene rubber have also provided improved carpets when coated on a woven, lubricated or unlubricated backing used to receive tufts of face yarns. Other acrylic latexes applied to the backing after weaving can also perform well in the finished carpeting from the standpoint of improving the characteristics of the backing to prevent or minimize tuft ravelling during the installation of the finished carpet product.

However of all of the different materials, solutions, dispersions or emulsions tried it has been found that a dispersion or emulsion of ethylene vinyl acetate copolymer in water with small amounts of surfactant, a gel agent and a latex, gave best results and is the preferred embodiment.

In using the inventive coatings hereinafter to be described in more detail, and in particular the preferred ethylene vinyl acetate copolymer (EVA), one is selected having a softening temperature in the range of 180°F to 200°F, so that when coated onto a lubricated or unlubricated backing, resealing of any ruptured yarn bonds caused by tufting occurs at 230°F to 280°F, which temperature range will be encountered by the backing in the drying of the carpet product after dyeing and/or latexing.

In addition to the improvement in tuft ravel resistance of the woven backings and carpet products made therewith which are treated with these inventive coatings, other advantages are also obtained. For example, it has been found that the coatings markedly improve carpet tuft lock, i.e., the ability of the face pile or yarn to resist pull out from the latex lamination, hence smaller amounts of latex can be used.

It has also been found that in the so-called patterned or "sculptured" tufted carpet, an improvement in pattern definition is achieved, thereby enhancing the appearance of the carpet and its commercial value.

Another advantage obtained is that since there coatings are compatible with practically all presently used latex materials including the final, or finish underside materials, the invention is readily adapted over a broadrange of applications.

In still another aspect of the invention, it has been found that woven backings when coated according to the invention, achieve a high degree of stabilization, by which is meant that objectionable sleaziness is eliminated thereby imparting to the backing better "body" so that, in tufting operations, its handling characteristics are much improved.

Yet another advantage, in particular when coating with EVA, is the increase found in dyeability of the carpet product since EVA takes on almost all commercial dye stuffs readily.

It should also be noted that the inventive backings herein set forth can be readily used in carpets having secondary backings, even when such secondary backings are made from jute, or other natural fibers with no harmful effects. In fact, such carpets will likewise enjoy all of the advantages hereinbefore set forth.

Accordingly the following examples are presented by way of illustration of the invention and its advantages as herein noted and presented. The examples are presented by way of illustrating the several embodiments including the preferred EVA embodiment above indicated, but it is understood that these examples are merely illustrative and not intended to limit the scope of the invention.

EXAMPLE I

A woven polypropylene backing fabric having a weave configuration of 22 ends per inch of ribbon yarn in the warp and 11 ends per inch of substantially round multifilament ends in the fill (Sample A, Table I) was coated on a textile padder and fused dried in a tentering frame at 310°F. The coating used was applied by immersion in a bath and picked up through a wringer to squeeze out extra coating. The coating solution was: Microfene FE-530 ethylene vinyl acetate copolymer made by the U.S. Industrial Chemical Co. having a softening temperature of about 190°F., –58.00 percent; a surfactant sold under the trademark IGEPAL CO-430, –0.43percent; a carboxylated styrene polybutadiene rubber latex supplied by the Dow Company as Dow 636 Latex, –4.27 percent; a 2 percent gel available to the trade as CARBOPOL 931; –2.50 percent and the rest water. –34.00 percent. The weight of coating after drying was 0.9 ounces per square yard.

An uncoated control fabric of similar weave configuration as above described except slightly denser i.e., 30 ends per inch in the warp and 13 ends per inch in the fill of the same type of yarn was also prepared (Sample B, Table I). Both fabrics, that is coated and uncoated, were processed through identical carpet operations on pilot scale equipment. After tufting comparisons between the control sample and the coated sample were made to determine the various characteristics in particular, fabric strength, and comparisons were also made with a non-woven fabric (Sample C, Table I). The data obtained are set forth in Table I herefollowing. From the data presented in Table I, a manyfold improvement in tuft ravel resistance is quite evident. For example, an increase of from 0.9 lbs, to 8.3 lbs. in the force required to pull out two rows of tufting in the coated tufted fabric as compared to the uncoated tufted fabric is most notable, and the 8.3 lbs. required to pull two rows compares quite favorably with the 13.6 lbs. pull necessary with non-woven fabric. Other features in which improvement was noted are in the important features of "tuft lock" and "fabric grab" tensile strength in the fill yarn direction. Although lower warp direction grab strength is noted, it is of little or no concern since warp grab strength is not critical and is proportional to the reduction in the number of warp ribbons in coated fabric as compared to the uncoated fabric. Therefore because fewer warp ends per inch are present in the coated fabric than in the control fabric, it is expected a lowering in grab strength would occur. However, it should also be noted that the number of ends per inch in the weave configuration was purposely decreased in order to compensate for the slight extra cost of coating.

The same three pile fabrics above and as noted in Table I herefollowing were subjected to the remainder of the carpet making procedure; i.e., latexing and the application of a high density foam backing to the bottom of the carpet. Note that on the right hand side of Table I, tuft ravel resistance of the woven coated backing carpet are shown to be equal, or nearly so, to the non-woven backing carpet.

TABLE I.—Coated woven backing versus uncoated versus non-woven backing

		TABLE I-a.—Tufted pile fabric (for tuft material see Note [3])						TABLE I-b.—Finished capret with foamed back (Latexing: Note (4), foam back: Note (5))	
		Tuft ravel resistance (lbs.) (Note (2))			Tuft lock (gms/tuft)	Fabric grab strength (lbs.)		Tuft ravel resistance (lbs.)	
Sample	Primary backing	One row pull	Two row pull	.7 Inch pull		Warp direction	Fill direction	One row pull	Two row pull
A (Note (1)).	Weave: 22×11; Coated with 0.9 oz./sq. yd. of EVA.	2.0	8.3	45.0	273	122	113	25.0	48.5
B (Note (1)).	Weave: 30 × 13; Uncoated, Std. DAW-BAC® backing.	0	.9	4.8	173	161	78	9.1	18.5
C................	Non-woven Typar, 4 oz./sq. yd., polypropylene.	4.2	13.6	108	N.A.	158	132	29.4	41.0

NOTES:
(1) A and B fabrics woven with polypropylene yarns: 0.050" × 0.002" ribbon warp and 12 filament filling, i.e., a multifilament yarn of 800 denier overall.
(2) Tuft ravel resistance determined as follows: 5 pins spaced over 2" inserted into back of tuft pile sample, 4" × 4"; force to pull out measured in lbs. on an Instron tester at 12"/Min. rate of extension. Three different values are obtained by inserting pins into first tuft row (one row pull), second row (two row pull), and 0.7 inches from edge, which is seventh row for 1/10 inch gage tufting.
(3) Tuft material: 28 oz. polypropylene bulked continuous filament, 3600 denier, 1/4 inch loop pile, 1/10 inch gage, 9 stitches per inch.
(4) Latex application: 20 oz. per sq. yd. standard latex coat on back of tufted backing.
(5) Foamed back: high density foam rubber adhesively attached to tufted, latexed backing.

EXAMPLE II

Three samples D, E, and F (Table II), of laboratory scale tufted pile fabrics were made, each with a different primary backing. The backing of sample D was coated with ethylene vinyl acetate copolymer; sample E was coated with a polyethylene dispersion in water with small amounts of a gel agent, latex and a styrene maleic anhydride polymer; and a sample F, an uncoated backing used as a control for comparison purposes. The backings were all woven polypropylene with the same weave configuration. Sample D was hand coated from the same ethylene vinyl acetate copolymer solution of Example I. Sample E was coated as noted above from a polyethylene dispersion above described. Each fabric was clamped in a restraining frame and placed in a 320°F. hot air oven for drying and fusion of the coating. The fabrics were then tufted on a tufting machine. Half of each tufted pile fabric sample was tested for ravel resistance and the other half was "mock-dyed" before testing. Mock dyeing was accomplished in a laboratory dye beck, and included boiling for 2 hours with the fabric sample in a "roping" condition in a typical nylon dispersed dye formulation with the dye stuffs omitted. A dye beck is an open trough containing the dye liquid and the carpet material is moved in and out of the liquid by a mechanism well known to the art. However, in this test, the fabric is subjected to a rather severe mechanical working due to the fact that as it moves through the dye beck it is twisted width and/or lengthwise into a rope-like condition. Hence the term "roping" above set forth.

The EVA coated sample D showed excellent retention of tuft ravel resistance after mock-dyeing. Sample E showed real improvement over Sample F.

The data obtained with respect to all of the features above is set forth in Table II.

240°F. for 15 minutes. The latex used was a carboxylated styrene butadiene rubber containing up to 3 percent carboxyl end groups with no filler. This sample fabric was tufted twelve inches wide with loop pile consisting of 3700 denier bulked continuous filament nylon on a 5/32 inch gauge tufting machine at 8 stitches per inch.

TABLE II.– EVA and polyethylene coated woven backing versus uncoated—before and after mock dyeing

		Undyed			Mock dyed (Note (3))		
		Bare .7 inch pull (Note (2))	Tuft ravel resist. (lbs)		Bare .7 inch pull (Note (2))	Tuft ravel resist. (lbs.)	
Sample	Primary backing		One row pull	.7 Inch pull		One row pull	.7 Inch pull
D	Weave: 30 × 13 Coated, with .8 oz./sq. yd. EVA.	46	4.4	16.3	46	12.9	42.8
E (Note (1))	Weave: 30 × 13 Coated with 1.0 oz./sq. yd. with polyethylene.	22	2.2	10.8	.8	1.0	6.0
F	Weave: 30 × 13 uncoated	.3	0	1.3	.7	.4	3.6

NOTES:

(1) Woven construction was the same for all: warp—30 ends/inch of .050" × 0.002 ribbon; filling—13 ends/inch of 12 filament yarn 800 denier overall.

(2) Bare ravel resistance for .7 inch pull was performed same way as tuft ravel resistance (Table I) except on bare, untufted backing.

(3) Mock dyed: exposed to all conditions of a disperse dyeing procedure except no dyestuffs were used. Formula included surfactants and dyeing aids; pH = 9. Rope in 12" wide laboratory dye beck: 2 hours at boil (205–210° F.).

(4) Tufting: Natural nylon bulked continuous filament, 3600 denier, 5/16" loop pile, 5/32" gage, 8½ stitches per inch.

EXAMPLE III

In an experiment to demonstrate that re-fusion of the coating on a backing in a tufted pile fabric can improve the tuft ravel resistance of the finished carpet, a portion of each of samples A and B tufted pile fabrics of Example I were mock-dyed in a pilot dye beck with the pile fabrics in a roped condition for one hour at the boiling point in a typical nylon dispersed dye formulation (dyestuffs omitted). At the end of 1 hour half of each sample was dryed through a pilot hot air tenter at 260°F. air temperature. Tuft ravel resistance was then compared with samples air dryed at room temperature.

Table III sets forth the results obtained from the data.

TABLE III

EVA COATED WOVEN BACKING

Re-fusion aids in Tuft Ravel Resistance

Primary Backing Sample	Room Temp. Air Drying Tuft Ravel Resist. lb. One Row Pull	Two Row Pull	260°F. Air Tenter Dried Tuft Ravel Resist. lb. One Row Pull	Two Row Pull
A	1.7	8.0	3.9	11.8
B	.1	1.6	.1	1.8

Notes:

1. Portion of A and B tufted pile fabrics of Table I were mock dyed (see Note 2) and dried in two ways: room air and 260°F. air.

2. Mock dyeing: In a pilot dye beck exposed to all conditions of a nylon disperse dyeing procedure except no dyestuffs were used. Formula included surfactants and dyeing aids; pH=8.5. Rope dyed for 1 hour at boil. See Table I for explanation of tests.

EXAMPLE IV

Sample G of woven polypropylene fabric of a weave configuration of 30 ends per inch of 500 denier ribbon in the warp and 11 ends per inch of 1100 denier ribbon in the fill was spray coated with a latex containing a solids to water ratio of 1 to 3 and air cured in an oven at

A portion, Sample H, of Sample G was mock-dyed for two hours at the boiling point in a dye basket containing 2,000 ml. of water, 10 ml. of non-ionic polyethylene oxide surfactant and 5 ml. of glacial acetic acid.

The sample was rinsed in cold water and air dryed. The results of physical testing of the above samples along with uncoated fabric, Samples I and J, treated in a like manner are set forth on Table IV.

TABLE IV

		Tuft ravel resistance (lbs.)			
Sample	Description	One row pull	Two row pull	.7 Inch pull	Tuft lock (grams/tuft)
G	0.89 oz/sq. yd. SBR* coating	4.0	17.0	36.0	155
H	This sample is mock-dyed sample G	9.4	22.0	45.0	400
I	No coating	0.7	1.8	8.0	138
J	This sample is mock-dyed sample I	.6	9.4	28.0	278

*SBR—a 3 percent carboxylated styrene butadiene rubber.

EXAMPLE V

A fabric prepared in a manner similar to any of those of Example IV was tested to determine tufted grab strength in the fill direction, the most critical strength requirement in the manufacture of carpets. This tudted fabric sample was coated with 0.44 oz./sq. yd. of coating and had a grab strength of 56 lbs. The tufted uncoated control fabric had 67 lbs.

Since it is usually found that this test normally has a variation of plus or minus 6 lbs., it is therefore considered that the difference between the coated and uncoated samples is not significant.

EXAMPLE VI

In an experiment to determine the effects of lubrication on a coated backing two fabric Samples, K and L, were prepared each having a weave configuration of 30 ends per inch of 500 denier polypropylene ribbons in the warp and 11 ends per inch of 1100 denier ribbon in the fill. One, Sample K, was spray coated with an EVA co-polymer having a solids to water ratio of 1 to 4. The coated fabric was dried and cured in air at 270°F in a tenter for 2 minutes. The coating weight was 0.5 oz. per sq. yd. Sample K was not lubricated after coating. After the coating was dried and cured the fabric was tufted with bulked continuous filament nylon, 2400 denier, 3/16 inch loop pile, 1/10 inch gauge at 10 stitches per inch. The tufted fabric sample was tested in accordance with the procedure set forth in Note (2) of Table I. Sample L was coated the same as Sample K and then sprayed on one side with an ethoxylated castor oil supplied by the Sylvan Chemicals Company and marketed under the trade mark SYN-LUBE 107. After coating and lubricating, Sample L was tufted and tested in the same manner as Sample K. The significant data and the results obtained from the testing of these two sample fabrics is given in Table V herefollowing. The lower values for grab strength as compared with Sample A, Table I is accounted for because of the difference in coating weight, i.e., 0.9 oz. per sq. yd. (Sample A) vs. 0.5 oz. per sq. yd. (Samples K and L).

TABLE V.—Coated woven backing versus lubricated coated woven backing

Sample	Primary backing	Fabric grab strength (lbs.) Fill direction	Tuft ravel resistance (lbs.) (Note (2)) Two row pull	.7 Inch pull	Tuft lock (gms/tuft)
K (Note (1))	Weave: 30 × 11; coated with 0.5 oz./sq. yd. of EVA; No lubricant.	39	4.8	21.8	106
L (Note (1))	Weave: 30 × 11; coated with 0.5 oz./sq. yd. of EVA; Lubricated (Note (3)).	78	3.2	18.1	130

NOTES:
(1) Fabrics woven with polypropylene yarns, 500 denier ribbons in warp and 1100 denier ribbons in fill.
(2) See Table I, Note 2 for test description.
(3) Lubricant: Coated fabric was sprayed with an ethoxylated castor dispersion, on one side, 1.2 percent by weight.

In another embodiment of the invention a coating can be applied to the polyolefin backing composed of an acrylic latex supplied to the trade by the Union Carbide Corporation and sold under its trademark UCAR Latex No. 891. This latex is a soft, flexible self-cross linking acrylic polymer and provides a coating for the backing which, when used in a tufted product of the character referred to hereinbefore, can enhance its tuft ravelling resistance in a significant way.

In still another embodiment of the invention, a woven plastic backing can be prepared which possesses superior tuft ravelling resistance and improved strength retention by applying to the backing a coating consisting of a mixture of any of the lubricating compounds set forth above and any of the coating materials also listed above, care being taken to insure adequate miscibility and compatibility of the mixed compounds with one another.

Thus by means of this invention is is possible to provide a woven polyolefin backing for tufted products wherein tuft ravelling resistance is substantially improved, and when cut as by even unskilled carpet installers results in a highly competitive and commercially acceptable product from that standpoint.

Accordingly, what has been invented and described herein and for which Letters Patent is desired, is understood to be capable of modifications and variations without departing from the scope and spirit thereof except as defined in the hereinafter subtended claims.

What is claimed is:

1. In a tuft pile fabric comprised of a primary woven backing of thermo plastic warp and fill yarns, rows of tufts of pile yarn tufted into said backing and a lamination of cured latex for adhesively attaching said tufts to the bottom side thereof for locking said tufts into said backing, the improvement comprising, coating said backing prior to tufting for improving the tuft ravel resistance of said fabric with a coating material selected from the group consisting of ethylene vinyl acetate copolymer, polyethylene, carboxylated styrene, butadiene rubber and an acrylic latex, said coating being applied in an amount of from about 0.5 ounces per square yard to about 0.9 ounces per square yard.

2. The fabric of claim **1** wherein the coating material is ethylene vinyl acetate copolymer.

3. The fabric of claim **1** wherein the coating material is carboxylated styrene polybutadiene rubber containing up to 3 percent carboxyl end groups.

4. The fabric of claim **1** wherein a lubricant is applied to at least one side of the backing.

5. The fabric of claim **4** wherein the amount of lubricant applied is in the range of from 0.2 to 12 percent by weight based on the weight of said woven fabric.

6. The fabric of claim **4** wherein the lubricant is a material selected from the group consisting of mineral oil, ethoxylated high fatty acids, and a mixture of calcium stearate and silicone.

7. The fabric of claim **4** wherein the lubricant is an ethoxylated castor oil.

8. A process for producing a tufted pile fabric of improved tuft ravelling resistance which comprises the steps of:

1. selecting a primary backing woven of thermoplastic warp and fill yarns;
2. coating said backing in an amount of from about 0.5 ounces per square yard to about 0.9 ounces per square yard with a material selected from the group consisting of ethylene vinyl acetate co-polymer, polyethylene, carboxylated styrene abutadiene rubber and an acrylic latex;
3. tufting rows of pile yarn into said backing; and,
4. applying a lamination of latex rubber to the underside of said coated backing for locking said tufts thereinto.

9. The process of claim **8** wherein the coating material is ethylene vinyl acetate copolymer.

10. The process of claim **8** wherein the coating material is carboxylated styrene butadiene rubber containing up to 3 percent carboxyl end groups.

11. The process of claim **8** wherein the coating material is applied to the backing prior to tufting of said pile thereinto.

12. The process of claim **8** wherein said coating is applied to said backing by spraying.

13. The process of claim **8** wherein said coating is applied to said backing by brushing.

14. The process of claim 8 wherein the coating is applied to the yarn prior to weaving by a roller.

15. The process of claim 8 wherein the coating is applied to said backing by immersing said backing in said coating material.

16. The process of claim 8 further including the step of applying to at least one side of the backing a lubricant.

17. The process of claim 16 wherein the amount of lubricant applied is in the range of from 0.2 percent to 12 percent by weight based on the weight of said woven fabric.

18. The process of claim 16 wherein the lubricant is a material selected from the group consisting of mineral oil, ethoxylated high fatty acids and a mixture of calcium stearate and silicone.

19. The process of claim 16 wherein the lubricant is an ethoxylated castor oil.

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