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2,707,160

JOHANNES BERNHARD HANS VAN ISSUM
KNOWN AS
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PILE FABRIC

Filed July 18, 1952

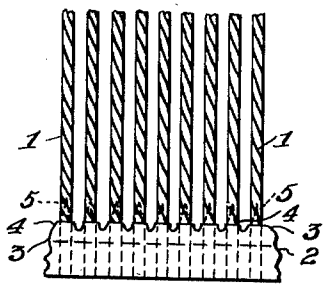


Fig. 1.

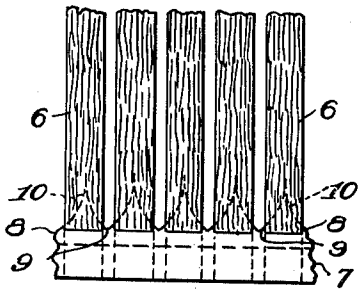


Fig. 3.

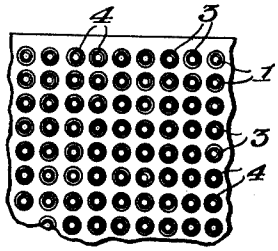


Fig. 2.

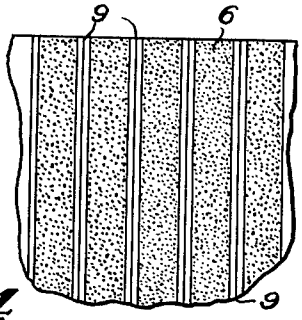


Fig. 4.

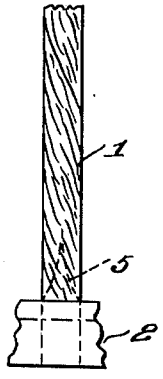


Fig. 5.

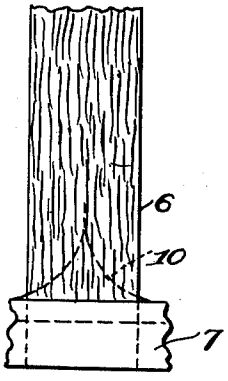


Fig. 6.

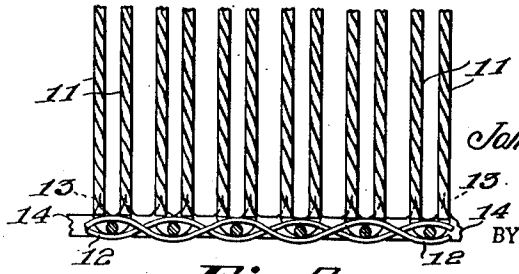


Fig. 7.

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2,707,160

PILE FABRIC

Johannes Bernhard Hans Van Issum, known as Hans Van Issum, deceased, late of Heaton, England, by Carola Van Issum, Heaton, and Thomas Francis Keegan, Bradford, England, administrators, assignors to Fabric Development Company Limited, Addingham, England, a company of Great Britain

Application July 18, 1952, Serial No. 299,614
Claims priority, application Great Britain July 24, 1951
2 Claims. (Cl. 154—49)

The invention relates to pile fabrics such as carpets, rugs, plush, velvet and imitation fur, and while it is particularly concerned with pile fabrics manufactured from unwoven material such as described in United States Patent Nos. 2,491,258 and 2,516,559 it is also concerned with those made of woven material.

The desirable characteristics of a pile fabric vary according to the use for which the fabric is intended.

A carpet, for example, the pile of which is composed of high grade substance, is pleasantly springy or resilient to walk on, and when relieved of the weight of the walker, quickly recovers its form. It also offers a high resistance to wear.

On the contrary a carpet made of yarn mixture consisting of fibres of little resistance or low quality fibrous substance such as reclaimed fibres, seems hard when walked on. The pile is apt to lie flat after use and does not regain its original form as it has practically no resilience and, moreover, has relatively poor resistance to wear.

A pile fabric simultating fur should be either soft or hard to the touch according to the skin it is to imitate.

A pile fabric according to the invention has the above desirable characteristics owing to the feature that the fibres or filaments of the pile are reinforced by protuberances from a layer of plastic forming part of the backing.

In the drawings:

Figures 1 and 2 are respectively an elevation and a plan of a portion of pile fabric in which the pile is composed of spaced tufts of spun fibrous substance or filaments.

Figures 3 and 4 are respectively an elevation and a plan of a portion of pile fabric in which the pile is composed of spaced rows of unspun fibrous substance or filaments.

Figures 5 and 6 are detail views illustrating modifications of the pile fabrics shown in the previous figures.

Figure 7 is an elevation of a portion of woven pile fabric.

The drawings are somewhat schematic and on an enlarged scale to enable the novel features to be clearly indicated.

In the example illustrated by Figures 1 and 2 the pile is composed of threads **1** of spun fibrous substance or filaments such as yarn and they are embedded at their lower ends in a plastic backing **2**.

They are arranged in spaced relation.

A method of manufacturing such a pile fabric is fully described in U. S. Patent No. 2,516,559.

The yarn pile threads are reinforced by protuberances **3** from the backing **2**. They partly surround the pile threads **1** adjacent to the backing as indicated at **4** and also penetrate the pile yarn threads **1** as indicated at **5**.

A method by which these protuberances are formed and caused to penetrate the pile yarn threads is fully described in the specification of a co-pending application for United States patent, Ser. No. 299,615 filed simultaneously with this application.

This method may be briefly described as follows:

A slab of gel such as alginate in which the yarn threads or tufts in parallel and spaced relation are embedded with their ends projecting from the upper surface of the slab is made by the method described in U. S. Patent No. 2,516,559. The slab is supported on a foraminous conveyor and carried over a suction chamber. While passing over the chamber a primary coating of a solution or emulsion of synthetic resin is sprayed over the upper surface of the slab and is sucked into intimate contact with the upper surface of the slab and into the pile yarn threads. Depressions are formed around the projecting yarn ends and are completely filled with the emulsion, forming with the emulsion which has penetrated the threads protuberances from the primary coating. The slab is passed on by the conveyor through a drying or curing chamber. From this it is coated with a thicker coating of synthetic resin which as the slab passes through another curing chamber becomes integral with the primary coating and constitutes the backing for the pile fabric eventually produced by removal of the gel from the pile threads.

The formation of depressions around the pile threads and degree of penetration depend on the pH value of the emulsion, which may be above or below 7. With an emulsion of low pH value protuberances may be formed which only penetrate the pile threads and consequently a modification of the pile fabric is obtained as illustrated by Figure 5.

In the example illustrated by Figures 3 and 4 the pile consists of spaced portions **6** of unspun fibrous substance such as sliver embedded at their lower ends in a backing **7** of plastic i. e. synthetic resin.

A method of producing such a pile fabric is fully described in U. S. Patent No. 2,491,258.

The pile is reinforced by protuberances **8** from the backing **7**, the protuberances being in the form of wedges or ridges partly alongside the portions **6** adjacent to the backing **7** as indicated at **9** and partly penetrating the portions **6** as indicated at **10**. In the modification shown in Figure 6 the protuberances only penetrate the sliver pile portions **6**.

A method of forming these protuberances is similar to that above referred to and as fully described in the co-pending application for U. S. patent also referred to above.

In Figure 7 a woven pile fabric e. g. a carpet, is diagrammatically or conventionally illustrated, consisting of a yarn pile **11** and woven backing **12**. The reinforcement of the pile **11** is effected by protuberances **13** from a coating **14** of plastic i. e. synthetic resin, in the backing.

In order to produce this reinforcement the carpet is first supported in a slab of alginate so that its pile is embedded but the backing exposed on the upper surface of the slab.

The slab is then conveyed on a foraminous conveyor over a vacuum chamber and the backing simultaneously sprayed with a coating of synthetic resin as in the previous examples and as fully described in the specification of the co-pending application referred to. After the coating has been cured it is left in the backing **12** the alginate being removed from the pile **11**, the coating being that indicated at **14**, Figure 7.

In the appended claims the term pile fabric is intended to cover a carpet, rug, mat, plush or similar article.

What is claimed is:

1. A pile fabric comprising a pile and a backing including a coating of synthetic resin, said coating having protuberances formed of synthetic resin integral with said coating and penetrating said pile for the purpose of reinforcing said pile, said protuberances forming wedges or ridges within the pile and extending a distance above the backing greater than any normal penetration caused by capillary action.

2. A pile fabric comprising a pile composed of yarn threads and a backing including a coating of synthetic resin, said coating having protuberances formed of synthetic resin integral with said coating and penetrating said yarn pile threads for the purpose of reinforcing them, said protuberances partly surround said pile threads and continue further as wedges or ridges within said pile threads a distance greater than any normal penetration caused by capillary action.

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