April 22, 1941. W. A. GIBBONS 2,239,457

FIRE REPELLENT PILE FABRIC

Filed Feb. 10, 1939

Fig. 1.

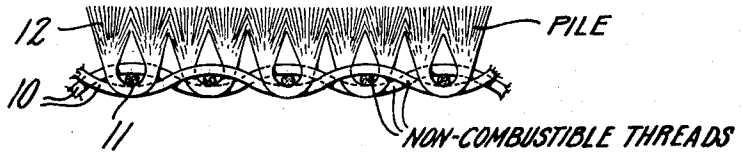


Fig. 2.

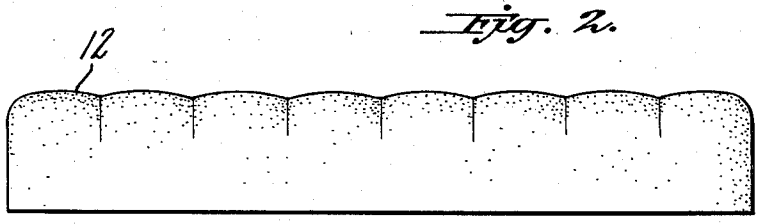
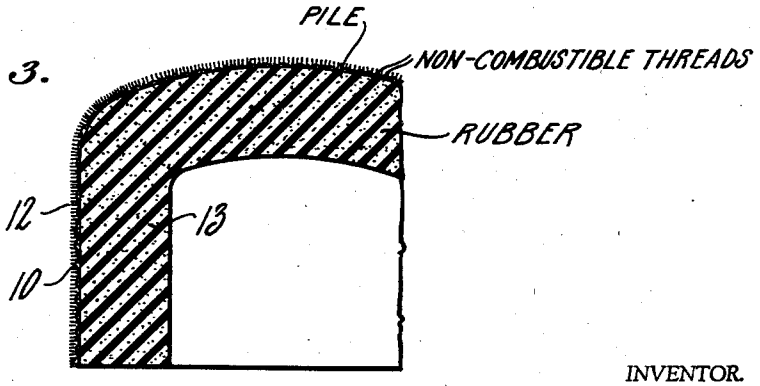


Fig. 3.



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FIRE REPELLENT PILE FABRIC

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8 Claims. (Cl. 139—391)

This invention relates to a fire repellent pile fabric consisting of a non-combustible ground fabric provided with a pile surface, and also to a cushion or the like of inflammable material which is covered with such fire repellent fabric.

Cushions formed of rubber, textile fibers and other organic materials are extensively used in automobiles and in airplanes and for various other purposes and such cushions are commonly provided with a protecting covering fabric consisting of a woven ground fabric having a pile surface. These protecting fabrics as constructed heretofore constitute an ornamental covering for the underlying cushion material and serve to protect the same from wear, but when such covering fabrics are formed of wool, cotton, or other textile fibers as heretofore they are inflammable, and therefore do not afford the underlying cushion material any substantial protection against combustion in case of fire.

When the underlying cushion is constructed of inflammable material and a fire occurs of sufficient intensity to ignite this material, then the cushion simply supplies added fuel to the conflagration. The present invention contemplates a simple and practical construction whereby the fire hazard caused by the combustible nature of the cushion material may be greatly reduced, and also contemplates a fire repellent pile fabric which may be employed for various purposes.

One important feature of the present invention resides in a fire repellent pile fabric comprising a non-combustible ground fabric formed of asbestos threads, spun glass filaments or other inorganic threads and having a pile surface provided at one face thereof.

Another important feature of the present invention resides in a cushion or the like formed of rubber, textile fibers or other organic material which is more or less inflammable, and which cushion is provided with a protecting fire repellent cover consisting of a non-combustible ground fabric formed of spun inorganic threads or of non-metallic inorganic threads and having a pile or other soft ornamental surface adapted to protect the underlying ground fabric from wear.

The fire repellent pile fabric herein contemplated may be woven in any preferred or well known manner to produce a pile fabric such as commonly used heretofore as an upholstery cover for cushions and the like, except that the ground fabric in accordance with the present invention is formed of non-combustible threads such as spun asbestos threads, spun glass threads or other threads formed of inorganic fibers or filaments of non-continuous length arranged so that the ends of the filaments overlap and are formed into a thread by a spinning or twisting operation. It is also contemplated that said ground fabric may be made in whole or in part of unspun or continuous glass filaments.

The non-combustible ground fabric just described, in accordance with the present invention, is provided with a much softer protecting wear surface, which in most cases constitutes a pile formed of wool or other textile fibers commonly used heretofore to form the pile tufts of a pile fabric. The present invention, however, contemplates that in some cases, the pile tufts as well as the ground fabric may be formed of non-combustible threads or filaments.

If a cushion formed of rubber or other inflammable material is covered with the fire repellent pile fabric herein contemplated, and is thereafter exposed to fire, the wool or other organic fibers forming the pile surface of the covering fabric will be burnt or charred if the temperature to which it is subjected is sufficiently high. But the non-combustible ground fabric will remain intact to form a protecting screen overlying the combustible material of the cushion, and while such non-combustible ground fabric may not in all cases prevent the underlying inflammable material from catching fire, it will nevertheless afford the cushion material a large amount of protection against combustion, thus greatly reducing the fire hazard.

The above and other features of the invention will be further understood from the following description when read in connection with the accompanying drawing illustrating good, practical forms of the invention.

In the drawing—

Fig. 1 on an enlarged scale is a longitudinal sectional view through a piece of pile fabric constructed in accordance with the present invention.

Fig. 2 is a front view of a cushion such as is commonly used as an automobile seat, having the present invention applied thereto; and

Fig. 3 on a larger scale is a sectional view through the cushion of Fig. 2.

The fire repellent pile fabric of the present invention, may as above stated, be constructed in any suitable or well known manner so far as the interweaving of the warp and weft threads is concerned and the securing of the pile tufts thereto, provided the threads used in making the ground fabric are sufficiently non-combustible to

afford the protection against fire contemplated by the present invention.

The fabric illustrated in Fig. 1 is constructed of a ground fabric formed of the interwoven warp threads 10 and weft threads 11. This ground fabric is shown as provided with the pile forming tufts 12 which are secured to the ground fabric by the weft threads 11 about which the tuft loops are bent in a well known manner. This showing of the fabric, however, is to be considered as more or less conventional since in the simple construction illustrated the pile forming tufts 12 would not be firmly anchored to the ground fabric unless some form of binding material were employed to help hold them in place.

The warp threads 10 and weft threads 11 are preferably but not necessarily formed of spun asbestos threads such for example as contemplated by the B. H. Foster Patent 2,089,021 granted August 3, 1937, for Asbestos yarn. It is contemplated, however, that other and coarser asbestos threads than those covered by the patent just mentioned may be employed. It is also contemplated that other spun threads of non-combustible inorganic fibers or filaments may be used in carrying out the present invention such for example as spun glass threads formed of non-continuous lengths of glass fibers or filaments arranged in overlapping relation and spun by a twisting operation into threads, which may be used as the warp threads 10 and weft threads 11.

In some cases it may be desirable to form the non-combustible portions of the fabric of Fig. 1 of non-metallic inorganic threads such for example as continuous glass filaments.

The pile forming tufts 12 are preferably formed of wool or other textile threads such as have been commonly used heretofore in forming the pile tufts of the type of pile fabrics commonly used in upholstery work, but since wool and other textile fibers are more or less combustible, it may in some cases be desirable to form these pile tufts 12 also of non-combustible inorganic threads similar to those employed to form the warp threads 10 and weft threads 11.

The pile fabric of Fig. 1 may be used for various purposes but it has been developed more particularly for use as an upholstery covering for automobile cushions or the like, such as shown in Fig. 2 wherein the entire cushion is shown as covered with the pile fabric material of Fig. 1. This however is better illustrated in Fig. 3 wherein the rubber or other soft material of which the cushion is constructed is designated by 13 and this cushion material is shown as covered by the pile fabric of Fig. 1. The cushion material 13 may be formed of sponge rubber, cellular rubber or various textile materials capable of providing the desired softness. In the present construction the appearance and feel of the cover for the cushion need not differ from that of the pile fabric cover of the cushions commonly employed heretofore, since the pile tufts 12 in the present construction may be formed of exactly the same material as the pile tufts commonly used heretofore, and while the non-combustible ground fabric 10, 11 differs from that employed heretofore it is protected and concealed by the pile surface 12.

Should an automobile, airplane or the like equipped with cushions such as shown in Fig. 2 be involved in an accident resulting in a conflagration, the textile fibers forming the pile tufts 12 may be quickly burned away but the remaining non-combustible ground fabric formed of the threads 10 and 11 would afford the underlying combustible material 13 a large amount of protection. Such protection results in part from the confining of the cushion material by the ground fabric and in part to the filtering or screening action of the woven non-combustible fabric which retards the penetration of the flame therethrough to ignite the underlying cushion material. Even if the underlying material should catch fire the confining and flame retarding action of the non-combustible ground fabric 10, 11 would retard the spread of the combustion and tend to extinguish the flame.

It will be seen from the foregoing that through the present invention the fire hazard resulting from the use of inflammable materials in the construction of cushions may be greatly reduced without in any way detracting from the appearance, feel or wear protecting properties of the pile fabric upholstery material herein employed to cover such cushions. It will also be understood that the fire repellent material herein contemplated may be used as a covering or protecting fabric for various objects.

It is desired to point out that the word "spun" has been employed herein in the specification and claims to describe the well known operation of forming a thread or yarn from non-continuous overlapping fibers or filaments by a twisting operation which unites the fibers and holds them from slipping lengthwise of each other as in a spun cotton yarn, and that the word "spun" as herein used does not mean the production of a continuous filament by an extruding operation.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A fire repellent pile fabric, comprising a woven non-combustible ground fabric formed of spun warp and weft threads of non-metallic, inorganic fibers and having pile threads interlocked therewith to form a protecting pile surface overlying the non-combustible ground fabric.

2. A fire repellent pile fabric, comprising a woven non-combustible ground fabric formed of asbestos warp and weft threads and having pile threads interlocked therewith to form a protecting pile surface overlying the non-combustible ground fabric.

3. A non-combustible pile fabric, comprising a woven ground fabric formed of spun warp and weft threads of non-metallic, inorganic fibers and having spun pile threads of inorganic fibers interlocked therewith to form a protecting pile surface overlying the non-combustible ground fabric.

4. A fire repellent upholstery fabric, comprising a woven non-combustible ground fabric formed of spun warp and weft threads of non-metallic, inorganic fibers and having pile threads interlocked therewith to form a protecting pile surface overlying the non-combustible ground fabric.

5. A fire repellent upholstery fabric, comprising a woven non-combustible ground fabric formed of interwoven asbestos threads and having pile threads interlocked therewith to form a protecting pile surface overlying the non-combustible ground fabric.

6. A fire repellent upholstery fabric comprising a woven non-combustible ground fabric formed of interwoven asbestos threads and having a softer, wear-resisting surface formed of textile threads attached to the ground fabric to form a pile surface that protects the ground fabric from wear.

7. A fire repellent pile fabric, comprising a

woven non-combustible ground fabric formed at least in part of non-metallic and non-combustible inorganic threads, and having pile forming threads interlocked with the ground fabric to provide a protecting pile surface overlying the non-combustible ground fabric.

8. A fire repellent pile fabric, comprising a woven ground fabric formed of interwoven non-metallic, inorganic, non-combustible warp and weft threads, and having pile forming threads interlocked with the ground fabric to form a protecting pile fabric overlying the ground fabric.

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