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METHOD OF MAKING REVERSIBLE NONWOVEN MATERIAL

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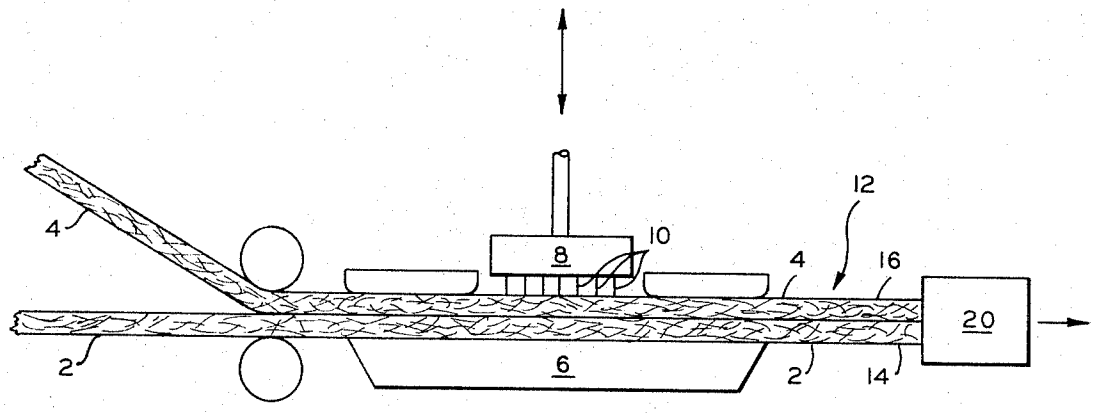


FIG. 1

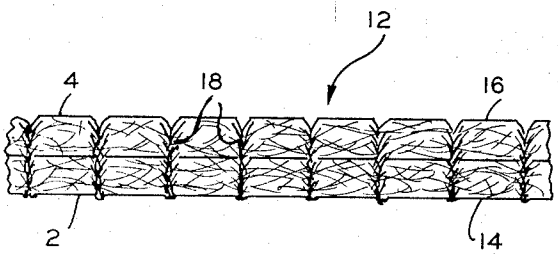


FIG. 2

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METHOD OF MAKING REVERSIBLE, NONWOVEN MATERIAL

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ABSTRACT OF THE DISCLOSURE

A reversible, nonwoven, fibrous material formed of first and second different colored bats forming said material which has different colored first and second surfaces and the process for making said material.

This invention resides in an improved nonwoven material and the process for making said backing. In another aspect, this invention resides in a reversible, nonwoven material having first and second opposed surfaces that are different colors and the process for making the backing.

Heretofore utilized carpet backing was generally formed of a needle punched bat of fibers that were substantially the same color. Where a carpet with a light colored nap or pile was to be formed, it was desirous to form said carpet with a light colored carpet backing. Conversely, where a carpet with a dark colored nap or pile was to be formed, it was generally preferred that said carpet be formed on a dark colored carpet backing. Where carpets of light and dark hues were formed it then became necessary to stock both light and dark colored carpet backing. Where it was desired to have the carpet backing be of substantially the same color as the nap and pile of the carpet, it was necessary to stock a different respective carpet backing for each different colored carpet desired to be manufactured.

It is therefore an object of this invention to provide nonwoven material having first and second surfaces and being of different colors on each surface and reversible and the process for making said material. Another object of this invention is to provide a nonwoven, reversible, material having first and second surfaces with the first surface being formed of light colored fibers and the second surface being formed of dark colored fibers with some light colored fibers of the first surface at spaced-apart locations and the process for making said material. Yet another object of this invention of the above-described type includes providing a method for attaching the light and dark colored fibers one to the other by needle punching. Other aspects, objects, and advantages of the present invention will become apparent from a study of the disclosure, the appended claims, and the drawings.

The drawings are diagrammatic views of the apparatus for forming the material of this invention and a cross section of the formed material. FIG. 1 shows the first and second bats being needle punched for forming the material of this invention and FIG. 2 shows a cross section of the formed material and the areas of attachment of the second bat to the first.

Referring to FIG. 1, a first bat 2 of fibers is laid down with a second bat 4 of fibers laid down in contact and upon the first bat 2. In this invention, it is essential that the second bat 4 of the fibers be of a different lighter color relative to the color of the first bat 2. The term "different lighter color" used herein means a color that is less dominant and/or less masking than the color of the first bat 2.

When the material of this invention is carpet backing for example, the total thickness of the first and second

bats 2, 4 is of the same relative order as other conventional carpet backing and can be readily substituted therefor.

The fibers of the bats 2, 4 are comprised principally of fibers of a thermoplastic material such as polypropylene, for example. The backing fabric is in the form of a sheet-like web formed by distributing the fibers in one or more superimposed layers on a carrier such as a low-count cotton cheesecloth, film or warp yarn. The fibers can be laid down in a random manner, oriented in a generally common direction, or layered with each layer being oriented in a different direction relative to the direction of the fiber layer upon which it rests. Other conventional means of forming the bats 2, 4 such as continuously moving belts or slats can be employed to support and transport layers of the fibers to a needling operation. It should be understood, however, that the fibers can be polypropylene, nylon, rayon, acrylic, polyester, or mixtures thereof, and other like fibers so long as the method and material conform to the limitations hereinafter set forth.

The first and second fiber bats 2, 4 pass over a supporting means 6 where they are needle punched together at spaced-apart locations with a reciprocating needle punching element 8 having spaced-apart needles 10. For forming the reversible, nonwoven material of this invention which has a first dark surface 14 and an opposed lighter, different colored second surface 16, it is essential that the second bat 4 be needle punched into the first bat 2. Where barbed needles are used, the barb should angle outwardly relative to the longitudinal axis of the needle when progressing toward the needle point for punching the bats from the side of the second bat 4 and when desired to punch the composite from the first bat 2 side, the barb should angle inwardly relative to the axis of the needle when progressing toward the needle point. It has been found that if the bats 2, 4 are needle punched together in a manner wherein the darker, dominant and/or masking colored first bat 2 is forced or drawn into the lighter colored bat, the material surface formed by the second bat 4 is substantially the same color as the first bat, thereby destroying the reversible unique feature of the material of this invention. The term "reversible" used herein means that either surface of the carpet backing can be used adjacent the nap or pile of the carpet or used where said surface may be seen. It should also be understood that the term "carpet backing" used herein and hereafter refers generally to the resultant material of this invention. The predominant use that is expected of the material of this invention is for carpet backing. Any use, however, may be made of the resultant material without departing from the aims and purposes of this invention and the term "carpet backing" is to be considered to refer to the resultant material of this invention regardless of the use made of said resultant material.

It is essential that the carpet backing be made of a first bat 2 of one color and a second bat 4 of a different lighter color. An example would be a first black bat and a second white or gray bat. By so forming the carpet backing, a single bat can be used for matching two different colored carpet piles, for example, thereby eliminating the need during manufacturing of carpet for maintaining two different colored separate carpet backings. It is important, however, to remember that when matching the different colored fiber bats together the different, lighter, less masking, less dominant color must be positioned as the second bat 4 and subsequent needle punching be performed from the side of the second bat 4 toward the first bat 2.

A heating means 20 such as heated nip rolls, an oven and the like are provided for increasing the temperature of the needle punched bats to a value at which parties of the bats are fused one to the other.

FIG. 2 shows a partial section of the reversible, nonwoven, fibrous carpet backing **12** of this invention. The covered backing **12** or resultant material has first and second opposed surfaces **14, 16** and is formed of first and second fibrous bats **2, 4.** The first surface **14** of the carpet backing **12** is formed of the first bat **2** and portions of said second bat **4** extending through the first bat **2.** The second surface **16** of the carpet backing **12** is formed of the second bat **4** that is a different lighter color relative to the first bat **2.** The portions of the second bat **4** that extend through the first bat **2** are the areas **18** at which the needles **10** penetrate the bats **2, 4** for attaching the bats one to the other.

Examples of the process and product of this invention are as follows:

EXAMPLE 1

A reversible nonwoven material was made by feeding gray polypropylene fiber bat and a black dyed fiber bat of the same material to a needle punch machine. The gray bat was the top layer, the top being the portion facing the descending needle loom. After needle punching, the resultant material was lightly fused by passing it through heated calendering rolls. The product was gray on one side and black on the other.

EXAMPLE 2

The procedure above was repeated except that the black fibers were on top. The resulting material was substantially gray-black on both sides and not reversible.

Other modifications and alterations of this invention will become apparent to those skilled in the art from the foregoing discussion and accompanying drawing, and it should be understood that this invention is not to be unduly limited thereto.

What is claimed is:

1. A process for forming reversible, nonwoven, fibrous material comprising:

laying down a first bat of fibers;

laying a second bat of fibers down upon said first bat, said second bat of fibers being of a different lighter color than said first bat; and

needle punching the bats together forcing fibers of the second bat into fibers of the first bat to attach the bats one to the other and form a reversible, nonwoven, fibrous carpet backing having a different color on each surface thereof.

2. A process, as set forth in claim **1,** wherein the first bat is black and the second bat is gray.

3. A process, as set forth in claim **1,** including heating the needle punched bats to fuse portions of the bats one to the other.

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