July 8, 1958 F. W. HARTSTEIN 2,842,472

NON-WOVEN CLOTH

Filed Oct. 5, 1955

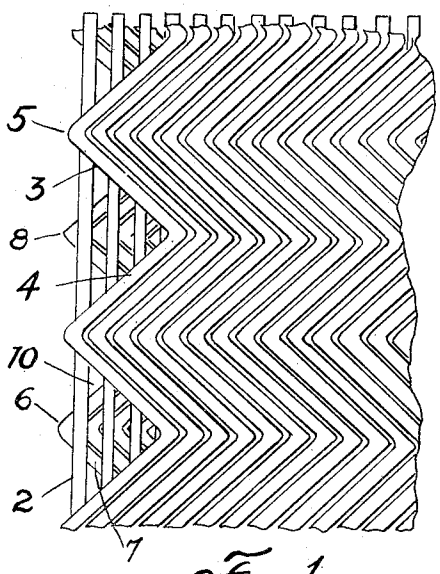


Fig 1

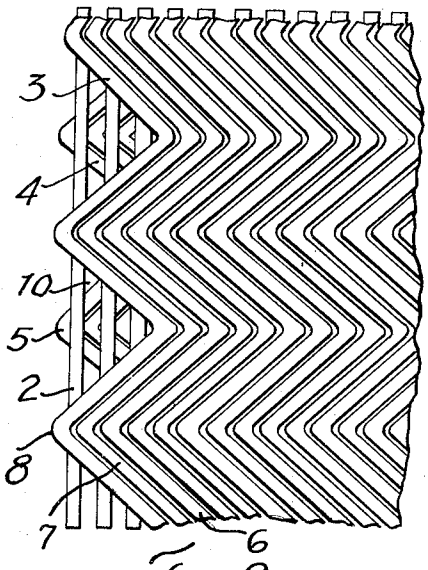


Fig. 2

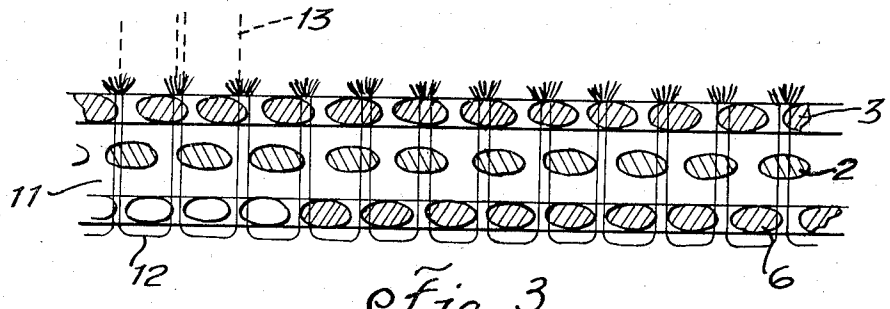


Fig. 3

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United States Patent Office 2,842,472 Patented July 8, 1958

2,842,472

NON-WOVEN CLOTH

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Application October 5, 1955, Serial No. 538,705

1 Claim. (Cl. 154—46)

My invention is an improvement in the art of producing cloth for various uses, such as, for example, the making of rugs for floors; especially rugs having a body with a top or wearing surface containing tufts or loops of yarn attached to the body of the rug, commonly known as "chenille" rugs.

The principal object of my invention is to provide a novel cloth that does not consist of a woven textile body, and can be turned out more quickly and at greatly reduced cost.

Another object is to provide a sheet of non-woven cloth without warp and weft threads interlaced as by means of a shuttle in a loom; but having a body containing numerous threads or cords in flat layers with portions crossing one another and disposed in close proximity throughout; so that the yarn which makes the loops or tufts for the napped or piled surface of a "chenille" rug cannot fail, as it is stitched through the body from one side to the other, to pass around or through one or more of the cords or threads at all points of penetration; and thus be securely held in place.

A further object is to provide such a body of cloth of the kind mentioned having threads or cords that are disposed in lines and directions that intersect and fill or occupy virtually the entire area of the body, leaving no vacant spaces that are open on both faces of the cloth. Hence all the tufts or loops of a "chenille" rug embedded in such cloth will be caught and tightly retained by said threads or cords.

An additional object is to provide cloth in which there are several layers of thread or cord in superposed relation, and each layer is in direct contact with an adjacent layer and firmly adhering thereto; and, when utilized for a "chenille" rug, the yarn or thread for the loops or tufts will be engaged in all said layers.

Still another object is to provide cloth having a body containing lines of thread or cord in superposed layers, some of which may be relatively heavy and coarse, particularly on one side that will be the back of a "chenille" rug that is to lie against the floor. Hence the pliability of the rug is diminished and stiffness and weight is imparted to the rug, and its bulk is increased to such an extent that it will never rumple or slip along the floor when walked upon; and risk of any one falling when stepping on the rug is obviated.

Yet a further object is to provide cloth having a body formed of threads or cords in superposed united layers, one or more of which may contain relatively thick threads or cords and is adapted to receive and hold a coating or layer of rubber or the like, so that when it serves as a body for a rug, it will have greater frictional engagement with the floor or other surface on which the rug is laid.

Other objects and advantages are made clear in the following description, and the characteristics of my improvement are defined in the claim. The drawings illustrate a preferred embodiment of my improvement, but numerous variations in minor respects can be adopted

in harmony with the general plan in which the invention resides.

On said drawings,

Figure 1 shows one side or face of a sheet of cloth according to my invention;

Figure 2 shows the opposite side; and

Figure 3 shows how the tufts or loops of a chenille rug are connected with the cords or threads in the cloth.

The numeral 1 indicates a body for a floor rug comprising a layer of cords or threads 2, which extend longitudinally of the body. They are located side by side, parallel to one another and to the opposite edges of the body and all the cords or lines of yarn 2 are preferably straight, and they make up the middle layer of the body 1, which is of course as long and as wide as the size of the rug requires.

On each face of the body 1 is another layer of cords or yarn extending from end to end and side to side of the body, and arranged in parallel zigzag lines. The upper layer shown in Figure 1 contains such lines of cords 3, and the undulant portions 4 are joined by rounded or somewhat peaked bends 5. The cords 2 may have small spaces between adjacent lines, but the cords 3 are close enough to be virtually all in contact with one another throughout. The layer of cords 3 thus covers substantially all the upper surface of the body 1.

The opposite face of the body 1 has a similar layer of cords 6, extending in zigzag lines over the full length and from one side to the other of the body 1. The undulant portions 7 of the cords 6 also have rounded bends 8, and the bends 5 and 8 do not coincide, but the bends in each set of zigzag cords 3 and 6 overlie the spaces 10 between the bends of the other set. The cords 6 also are all virtually in contact with one another over the whole extent of the body 1, and thus the texture of the body is continuous throughout and has no interstices or small crevices in either or both surfaces into which yarn to form double-stemmed tufts or loops for the piled wearing surface of a rug might be forced, without being engaged by one of the cords 2, 3 or 6, and made fast to the body 1. Bends 8 may also be peaked.

All the central cords 2 are given a light coating of adhesive to hold the layers together. The cords or lines of yarn may all be of one size in the three layers, or in one layer the zigzag cords may be relatively coarse, if desired, to impart stiffness and bulk to the body, so that it will not easily fold or rumple. A rug made with such cloth will tend to remain flat when laid out on a floor or other supporting surface. When a rug is desired, the body after completion is subjected to the action of a multiplicity of needles in a "chenille rug" machine of well known construction to stitch the yarn through to form the piled surface. This operation is diagrammatically indicated in Figure 3, which shows a line of yarn 11 passing with successive bends 12 through all the layers 2, 3 and 6, and presenting successive loops 13 upon the layer 3, for instance. When the outer ends of the loops 13 between the bends are cut off, pile elements consisting of the usual two-stemmed tufts 14 remain, covering the entire layer 2. At no point in the body will yarn at the bends 12 pass through an opening between the cords, because there is no such orifice or opening; and fail to be caught by at least one thread; but all pile threads will transfix the cords of at least one layer and thus the yarn will be actually connected to the body at all of the bends 12. When the piled surface of the rug is finished, a layer of rubber or other suitable material is coated upon the opposite side of the rug, and this layer will cover the bends 12 and all the cords 6. Cloth according to this invention can of course be used for many other purposes, such as bagging or wrapping material.

The body 1 is comparable to woven fabric turned out

in a loom; thus in rug making, the expense of installing and operating looms is obviated. Such looms, though not usually part of the equipment of a rug plant, must be set up somewhere else and be of sufficient capacity to supply a rug-making machine fully. A chenille rug machine operates faster than a loom, and many looms are required to deliver enough cloth to keep a chenille machine in regular operation. The cost of looms is necessarily high and the yardage produced is priced accordingly. Further, the cost of weaving cloth in a loom increases as the width of the cloth increases, because the shuttle throw is longer; and, moreover, in woven cloth with warp and weft, the weft threads are under greater stress in cloth of greater width, and such cloth is sometimes "spongy" in many places. With cloth produced as described herein, cloth of great width can be made as easily and rapidly as cloth of less width. All the cords **2**, **3** and **6** will be equally stressed everywhere in the process; and the cloth will be uniformly flat and not "spongy" at any point.

With my invention, no looms for woven cloth are needed, for the body **1** can be made with a much simpler and less expensive machine, as set forth in my copending application Serial No. 538,706 of even date herewith, and more rapidly and at greatly reduced expense. The cloth is durable and attractive in appearance. With cloth of this invention rugs, for instance, can be made cheaply enough to compete with reed or grass rugs which are brought into service during summers and other warm seasons. Such rugs would of course not have a piled surface.

Rugs of the last-named variety can be plain without a piled or tufted wearing surface, and may be turned out with two layers of yarn, as well as three layers.

In chenille rug making, after a coating of plastic such as rubber is put upon the cords **6** for the under face of the rug, the rug is then dyed and finished.

When intended to serve other purposes, the loops or tufts are omitted and the cords in the layers **2**, **3** and **6** may receive a light spraying or coating of plastic, if desired, and then used for bagging or wrapping material, the plastic being put on by spraying.

The lines of yarn **2**, **3** and **6** are shown in part only

in the drawings, but it is of course understood that the three layers will extend over the entire area indicated by the numeral **1** for all widths and lengths of such cloth.

The cloth above described may sometimes be made with fewer zigzag lines of yarn such as the yarns **3** and **6**, so that the zigzag or undulant portions **4** are spaced apart, leaving interstices in the body of the cloth. When thus finished the cloth will be mesh cloth like netting.

The cloth of this invention can also be wrought with two groups or layers only instead of three, one layer containing yarn in straight lines and other yarn in zigzag lines, or both groups or layers may contain yarn in zigzag lines; with the adhesive on either layer, as may be desired.

Having described my invention, what I believe to be new is:

Cloth having a body comprising a layer of straight parallel cords and two other layers of cords, one upon each face of the aforesaid layer, the cords of each layer lying flat in the plane thereof, the cords of the other layers crossing the straight cords in zigzag lines and in contact therewith at all points of intersection, and united thereto at all said points of contact, the bent portions of the zigzag cords of one of said other layers coinciding with spaces between the bends in the zigzag cords of the remaining other layer, said cords of the zigzag layers being substantially all in contact with one another over the whole extent of the body, whereby the texture of the body is substantially continuous throughout.

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